1) Management accounting:
A) focuses on estimating future revenues, costs, and other measures to forecast activities and their results
B) provides information about the company as a whole
C) reports information that has occurred in the past that is verifiable and reliable
D) provides information that is generally available only on a quarterly or annual basis
Answer: A
Diff: 2
Terms: treasury
Objective: 1
AACSB: Reflective thinking

2) Managers use management accounting information to ________ strategy.
A) choose
B) communicate
C) implement
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: total quality management (TQM)
Objective: 1
AACSB: Analytical skills

3) Financial accounting:
A) focuses on the future and includes activities such as preparing next year's operating budget
B) must comply with GAAP (generally accepted accounting principles)
C) reports include detailed information on the various operating segments of the business such as product lines or departments
D) is prepared for the use of department heads and other employees
Answer: B
Diff: 2
Terms: financial accounting
Objective: 1
AACSB: Reflective thinking
4) The person most likely to use ONLY financial accounting information is a:
A) factory shift supervisor
B) vice president of operations
C) current shareholder
D) department manager
Answer: C
Diff: 1
Terms: financial accounting
Objective: 1
AACSB: Analytical skills

5) Which of the following people is LEAST likely to use management accounting information?
A) the controller
B) a shareholder evaluating a stock investment
C) the treasurer
D) an assembly department supervisor
Answer: B
Diff: 1
Terms: treasury
Objective: 1
AACSB: Analytical skills

6) Financial accounting provides the primary source of information for:
A) decision making in the finishing department
B) improving customer service
C) preparing the income statement for shareholders
D) planning next year's operating budget
Answer: C
Diff: 2
Terms: financial accounting
Objective: 1
AACSB: Reflective thinking

7) Which of the following descriptors refers to management accounting information?
A) It is verifiable and reliable.
B) It is driven by rules.
C) It is prepared for shareholders.
D) It provides reasonable and timely estimates.
Answer: D
Diff: 2
Terms: treasury
Objective: 1
AACSB: Reflective thinking
8) Which of the following statements refers to management accounting information?
A) There are no regulations governing the reports.
B) The reports are generally delayed and historical.
C) The audience tends to be stockholders, creditors, and tax authorities.
D) It primarily measures and records business transactions.
Answer: A
Diff: 2
Terms: treasury
Objective: 1
AACSB: Reflective thinking

9) Which of the following groups would be LEAST likely to receive detailed management accounting reports?
A) stockholders
B) sales representatives
C) production supervisors
D) managers
Answer: A
Diff: 1
Terms: treasury
Objective: 1
AACSB: Analytical skills

10) Management accounting information includes:
A) tabulated results of customer satisfaction surveys
B) the cost of producing a product
C) the percentage of units produced that are defective
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: treasury
Objective: 1
AACSB: Reflective thinking

11) Cost accounting:
A) provides information on the efficiency of factory labor
B) provides information on the cost of servicing commercial customers
C) provides information on the performance of an operating division
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: cost accounting
Objective: 1
AACSB: Reflective thinking
12) Which of the following types of information are used in management accounting?
A) financial information
B) nonfinancial information
C) information focused on the long term
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: treasury
Objective: 1
AACSB: Reflective thinking

13) Modern cost accounting plays a role in:
A) planning new products
B) evaluating operational processes
C) controlling costs
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: cost accounting
Objective: 1
AACSB: Reflective thinking

14) A data warehouse or infobarn:
A) is reserved for exclusive use by the CFO
B) is primarily used for financial reporting purposes
C) stores information used by different managers for multiple purposes
D) gathers only nonfinancial information
Answer: C
Diff: 1
Terms: cost accounting
Objective: 1
AACSB: Reflective thinking

15) Cost accounting provides all of the following EXCEPT:
A) information for management accounting and financial accounting
B) pricing information from marketing studies
C) financial information regarding the cost of acquiring resources
D) nonfinancial information regarding the cost of operational efficiencies
Answer: B
Diff: 2
Terms: cost accounting
Objective: 1
AACSB: Reflective thinking
16) Management accounting includes all of the following EXCEPT
A) implementing strategies
B) developing budgets
C) preparing special studies and forecasts
D) preparing the statement of cash flows
Answer: D
Diff: 1
Terms: treasury
Objective: 1
AACSB: Reflective thinking

17) Financial accounting is concerned primarily with:
A) external reporting to investors, creditors, and government authorities
B) cost planning and cost controls
C) profitability analysis
D) providing information for strategic and tactical decisions
Answer: A
Diff: 2
Terms: financial accounting
Objective: 1
AACSB: Reflective thinking

18) Financial accounting provides a historical perspective, whereas management accounting emphasizes:
A) the future
B) past transactions
C) a current perspective
D) reports to shareholders
Answer: A
Diff: 1
Terms: financial accounting
Objective: 1
AACSB: Reflective thinking

19) An Enterprise Resource Planning System can best be described as:
A) a collection of programs that use a variety of unconnected databases
B) a single database that collects data and feeds it into applications that support each of the company's business activities, such as purchases, production, distribution, and sales
C) a database that is primarily used by a purchasing department to determine the correct amount of a particular supply item to purchase
D) a sophisticated means of linking two or more companies to facilitate their planning processes
Answer: B
Diff: 1
Terms: cost accounting
Objective: 1
AACSB: Use of Information Technology
20) The approaches and activities of managers in short-run and long-run planning and control decisions that increase value for customers and lower costs of products and services are known as:
   A) value chain management
   B) enterprise resource planning
   C) cost management
   D) customer value management
   Answer: C
   Diff: 1
   Terms: cost management
   Objective: 1
   AACSB: Analytical skills

21) Management accounting information focuses on external reporting.
   Answer: FALSE
   Explanation: Management accounting information focuses on internal reporting.
   Diff: 1
   Terms: treasury
   Objective: 1
   AACSB: Reflective thinking

22) Cost management is narrowly focused on a continuous reduction of costs.
   Answer: FALSE
   Explanation: Cost management is broadly focused to provide information that helps managers at all levels implement, monitor, and evaluate company strategies.
   Diff: 2
   Terms: cost management
   Objective: 1
   AACSB: Analytical skills

23) Managers always require the information in an accounting system to be presented in the same format.
   Answer: FALSE
   Explanation: Individual managers often require the information in an accounting system to be presented or reported differently.
   Diff: 1
   Terms: treasury
   Objective: 1
   AACSB: Analytical skills

24) Modern cost accounting takes the perspective that collecting cost information is a function of the management decisions being made.
   Answer: TRUE
   Diff: 1
   Terms: cost accounting
   Objective: 1
   AACSB: Analytical skills
25) The balance sheet, income statement, and statement of cash flows are used for financial accounting, and also for management accounting.
Answer: TRUE
Diff: 1
Terms: financial accounting
Objective: 1
AACSB: Analytical skills

26) Financial accounting is broader in scope than management accounting.
Answer: FALSE
Explanation: Management accounting is broader in scope than financial accounting.
Diff: 2
Terms: financial accounting, management accounting
Objective: 1
AACSB: Reflective thinking

27) Cost accounting measures and reports short-term, long-term, financial, and non financial information.
Answer: TRUE
Diff: 2
Terms: cost accounting
Objective: 1
AACSB: Reflective thinking

28) Cost management provides information that helps increase value for customers.
Answer: TRUE
Diff: 1
Terms: cost management
Objective: 1
AACSB: Reflective thinking

29) Management accounting has to strictly follow the rules of generally accepted accounting principles for the purposes of measurement and reporting.
Answer: FALSE
Explanation: Internal measures and reports do not have to follow GAAP.
Diff: 1
Terms: treasury
Objective: 1
AACSB: Ethical reasoning

30) An ideal database should store information in a way that allows different managers to access the information they need.
Answer: TRUE
Diff: 1
Terms: treasury
Objective: 1
AACSB: Reflective thinking
31) An Enterprise Resource Planning (ERP) System is a single database that collects data and feeds into applications that support each of the company's business activities, such as purchases, production, distribution, and sales.

   Answer: TRUE
   Diff: 1
   Terms: treasury
   Objective: 1
   AACSB: Use of Information Technology

32) Cost accounting provides information only for management accounting purposes.

   Answer: FALSE
   Explanation: Cost accounting provides information for financial accounting as well as for management accounting purposes.
   Diff: 1
   Terms: cost accounting
   Objective: 1
   AACSB: Reflective thinking

33) Cost management involves long-term and short-term decisions that attempt to increase value for customers and lower costs of products or services.

   Answer: TRUE
   Diff: 1
   Terms: cost management
   Objective: 1
   AACSB: Reflective thinking

34) For each report listed below, identify whether the major purpose of the report is for (1) routine internal reporting, (2) nonroutine internal reporting, or for (3) external reporting to investors and other outside parties.

   Item:
   a. study detailing sale information of the top-ten selling products
   b. weekly report of total sales generated by each store in the metropolitan area
   c. annual Report sent to shareholders
   d. monthly report comparing budgeted sales by store to actual sales

   Answer:
   a. (2) nonroutine internal reporting
   b. (1) routine internal reporting
   c. (3) external reporting to investors and other outside parties
   d. (1) routine internal reporting

   Diff: 2
   Terms: treasury
   Objective: 1
   AACSB: Analytical skills
Answer: Management accounting provides information to internal decision makers of the business such as top executives, managers, sales representatives, and production supervisors. Its purpose is to help managers predict and evaluate future results. Reports are generated often and usually broken down into smaller reporting divisions such as department or product line. There are no rules to be complied with since these reports are for internal use only. Management accounting embraces more extensively such topics as the development and implementation of strategies and policies, budgeting, special studies and forecasts, influence on employee behavior, and nonfinancial as well as financial information.

Financial accounting, by contrast, provides information to external decision makers such as investors and creditors. Its purpose is to present a fair picture of the financial condition of the company. Reports are generated quarterly or annually and report on the company as a whole. The financial statements must comply with GAAP (generally accepted accounting principles). A CPA audits, or verifies, that the GAAP are being followed.

Diff: 2
Terms: treasury
Objective: 1
AACSB: Reflective thinking

36) Is financial accounting or management accounting more useful to an operations manager? Why?
Answer: Management accounting is more useful to an operations manager because management accounting reports operating results by department or unit rather than for the company as a whole, it includes financial as well as nonfinancial data such as on-time deliveries and cycle times, and it includes quantitative as well as qualitative data such as the type of rework that was needed on defective units.

Diff: 3
Terms: treasury
Objective: 1
AACSB: Reflective thinking

37) Is it possible to have an active cost management program without an Enterprise Resource Planning (ERP) System?
Answer: Yes, an active cost management program can occur without an Enterprise Resource Planning (ERP) System. Cost management is a philosophy that guides management in their short-run and long-run planning and control decisions that increase value for customers and lower costs of products and services. Cost management is not dependent on any particular system or database, but it is rather an overall philosophy of operation.

Diff: 2
Terms: cost management
Objective: 1
AACSB: Reflective thinking
38) What competitive advantage could a company obtain from a successful cost management program? 
Answer: There are three broad outcomes from a successful cost management program: 1) costs are reduced with no loss in customer value. In this scenario, a company might gain a competitive advantage by lowering its price with no loss in profit, or maintain the same price and increase profit; 2) customer value is increased with no change in costs. This scenario might increase customer satisfaction resulting in increased customer loyalty and perhaps increase the overall demand for the product; 3) customer value might be increased while costs are reduced simultaneously. This scenario would result in the benefits described in both 1) and 2).

Diff: 2
Terms: cost management
Objective: 1
AACSB: Reflective thinking

Objective 1.2

1) Which of the following statements concerning an organization's strategy is NOT true?
A) Strategy specifies how an organization matches its own capabilities with the opportunities in the marketplace to accomplish its objectives.
B) Management accountants provide input to help managers formulate strategy.
C) A good strategy will always overcome poor implementation.
D) Businesses usually follow one of two broad strategies: offering a quality product at a low price, or offering a unique product or service priced higher than the competition.
Answer: C
Diff: 2
Terms: total quality management (TQM)
Objective: 2
AACSB: Analytical skills

2) Strategy specifies:
A) how an organization matches its own capabilities with the opportunities in the marketplace
B) standard procedures to ensure quality products
C) incremental changes for improved performance
D) the demand created for products and services
Answer: A
Diff: 2
Terms: total quality management (TQM)
Objective: 2
AACSB: Reflective thinking

3) Which of the following is NOT one of the questions management accountants might attempt to help answer in the formulation of strategy?
A) Who are our most important customers?
B) What substitute products exist in the marketplace?
C) Does the strategy comply with GAAP (Generally Accepted Accounting Principles)?
D) Will adequate cash be available to implement the strategy?
Answer: C
Diff: 2
Terms: total quality management (TQM)
Objective: 2
AACSB: Analytical skills
4) Strategy is formulated by answering all of the following EXCEPT:
A) Who are our most important customers?
B) Is industry demand growing or shrinking?
C) Will our external auditors certify our strategy?
D) How sensitive are purchasers to price, quality, and service?
Answer: C
Diff: 3
Terms: total quality management (TQM)
Objective: 2
AACSB: Analytical skills

5) In designing strategy, a company must match the opportunities and threats in the marketplace with:
A) those of the CFO (Chief Financial Officer)
B) its resources and capabilities
C) branding opportunities
D) capabilities of current suppliers
Answer: B
Diff: 2
Terms: total quality management (TQM)
Objective: 2
AACSB: Analytical skills

6) Which of the following statements about customer value is NOT true?
A) Customer value is shown in a corporation's balance sheet.
B) Creating value for customers is an important part of planning and implementing strategy.
C) How our product delivers customer value should be determined as part of a company's strategy formulation.
D) It is possible to simultaneously lower cost and increase customer value.
Answer: A
Diff: 1
Terms: total quality management (TQM)
Objective: 2
AACSB: Analytical skills

7) Strategy does NOT specify how an organization matches its capabilities with the opportunities in the marketplace.
Answer: FALSE
Explanation: Strategy specifies how an organization matches its own capabilities with the opportunities in the marketplace to accomplish its objectives.
Diff: 1
Terms: total quality management (TQM)
Objective: 2
AACSB: Reflective thinking
8) Southwest Airlines is an example of a company that pursues a product differentiation strategy.  
Answer: FALSE  
Explanation: Southwest Airlines pursues a cost leadership strategy.  
Diff: 1  
Terms: total quality management (TQM)  
Objective: 2  
AACSB: Analytical skills

9) The best-designed strategies are valuable whether or not they are effectively implemented.  
Answer: FALSE  
Explanation: Implementation is essential or the strategy is useless.  
Diff: 1  
Terms: total quality management (TQM)  
Objective: 2  
AACSB: Analytical skills

10) The key to a company's success is creating value for customers while differentiating itself from its competitors.  
Answer: TRUE  
Diff: 1  
Terms: total quality management (TQM)  
Objective: 2  
AACSB: Reflective thinking

11) The key to a company's success is always to be the low cost producer in a particular industry.  
Answer: FALSE  
Explanation: The low cost producer in a particular industry will not necessarily be successful.  
Diff: 2  
Terms: total quality management (TQM)  
Objective: 2  
AACSB: Reflective thinking

12) Companies generally follow one of two basic strategies: 1) providing a quality product or service at low prices, or 2) offering a unique product or service often priced higher than competing products.  
Answer: TRUE  
Diff: 2  
Terms: total quality management (TQM)  
Objective: 2  
AACSB: Reflective thinking

13) Management accountants should have little or no role in deciding on a company's strategy.  
Answer: FALSE  
Explanation: Management accountants should play a significant role in deciding on a company's strategy.  
Diff: 1  
Terms: total quality management (TQM)  
Objective: 2  
AACSB: Reflective thinking
14) Companies can decide on an appropriate strategy based strictly on internally available information. 
Answer: FALSE
Explanation: Companies must obtain external information as well as internal information to decide on an appropriate strategy.
Diff: 1
Terms: total quality management (TQM)
Objective: 2
AACSB: Reflective thinking

15) Strategic cost management describes cost management that specifically focuses on strategic issues.
Answer: TRUE
Diff: 1
Terms: strategic cost management
Objective: 2
AACSB: Reflective thinking

16) Identifying a company's most important customers does NOT help formulate strategy.
Answer: FALSE
Explanation: Management accountants help formulate strategy by helping managers answer questions such as "Who are our most important customers, and how do we deliver value to them?"
Diff: 1
Terms: strategic cost management
Objective: 2
AACSB: Analytical skills

17) The best-designed strategies and the best-developed capabilities are useless unless they are effectively executed.
Answer: TRUE
Diff: 1
Terms: total quality management (TQM)
Objective: 2
AACSB: Analytical skills

18) Describe the major differences between management accounting and financial accounting for the following:
1. Primary users
2. Focus and emphasis
3. Rules of measurement and reporting
Answer:
1. The primary users of management accounting information are managers of the organization. The primary users of financial accounting are external users such as investors, banks, regulators, and suppliers.
3. Management accounting measurement and reporting does not have to follow GAAP but are based on cost-benefit analysis. Financial accounting measurement and reporting must be prepared in accordance with GAAP and be certified by external, independent auditors.
Diff: 2
Terms: financial accounting, management accounting
Objective: 2
AACSB: Analytical skills
19) What is strategy? Briefly describe the two broad types of strategies that companies may choose to pursue.
Answer: Strategy specifies how an organization matches its own capabilities with the opportunities in the marketplace to accomplish its objectives. In other words, strategy describes how a company will compete.

Companies follow one of two broad strategies. One is provide a quality product or service at low prices. The other is to compete on their ability to offer a unique product or service that is generally offered at a higher price.
Diff: 2
Terms: total quality management (TQM)
Objective: 2
AACSB: Reflective thinking

20) Briefly describe how managers make use of management accounting information.
Answer:
ONE: To choose strategy, to communicate it, and to determine how best to implement it.
TWO: To plan business operations related to designing, producing, and marketing a product or service. This includes preparing budgets and determining the prices and cost of products and services. A company must know the cost of each product and service to decide which products to offer and whether to expand or discontinue product lines.
THREE: To control business operations that includes comparing actual results to the budgeted results and taking corrective action when needed.
Diff: 2
Terms: strategy, planning
Objective: 2
AACSB: Reflective thinking
21) Generally, companies follow one of two broad strategies: offering a quality product at a low price, or offering a unique product or service priced higher than the competition. Assume you are opening a small food outlet across the street from your campus. How might that business be operated under each of the two broad strategies? Consider the following specific operational areas:

a. target customers  
b. products offered  
c. product pricing  
d. location choice  
e. advertising content  
f. advertising media

Answer: The purpose of this question is to explore some of the differences in business operations as a result of a broad strategic choice. Answers will differ from student to student, but you should see some specific themes.

<table>
<thead>
<tr>
<th>Operational Area</th>
<th>Low Price Strategy</th>
<th>Differential Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target customers</td>
<td>Target customers might be students on a tight budget</td>
<td>Target customers might be more wealthy students, faculty, or perhaps neighbors who live nearby.</td>
</tr>
<tr>
<td>Products offered</td>
<td>Few products, heavy emphasis on tight cost control, probably set up as a high volume operation.</td>
<td>High quality products, probably a reasonable choice, restaurant might have a lot of ambience.</td>
</tr>
<tr>
<td>Product pricing</td>
<td>Priced at or lower than the competition in the area.</td>
<td>Higher priced products.</td>
</tr>
<tr>
<td>Location choice</td>
<td>Convenient to the target customers.</td>
<td>Not as convenient, perhaps in a higher-end shopping or entertainment area. Customers might seek out the high quality and be willing to travel a bit for it.</td>
</tr>
<tr>
<td>Advertising content</td>
<td>Advertising would emphasize the low price of the products offered.</td>
<td>Advertising would emphasize quality or ambience.</td>
</tr>
<tr>
<td>Advertising media</td>
<td>Media that would be looked at by the target customers, such as student newspapers.</td>
<td>Media that would be looked at by the target customer, local magazines and newspapers.</td>
</tr>
</tbody>
</table>

Diff: 3  
Terms: total quality management (TQM)  
Objective: 2  
AACSB: Reflective thinking
22) Generally, companies follow one of two broad strategies: offering a quality product at a low price, or offering a unique product or service priced higher than the competition. Is it possible to follow a strategy that is "in the middle"?

Answer: There is some dispute about the correct answer to this question. Some will argue that it is not good for companies to get "caught in the middle" because the customer might get confused as to whether or not the company is competing on price or is trying to make some other appeal. If the customer is confused about how the company is giving them value, they might perceive they are getting no value and abandon the product to a competitor with a clearer customer value proposition. The other side of the argument is that cost management is a necessary part of any strategy and even if the company chooses to pursue a differential strategy, management of the company should always be seeking ways to manage costs and increase customer value simultaneously regardless of their strategy. The student should be able to articulate one or the other arguments coherently.

Diff: 2
Terms: total quality management (TQM)
Objective: 2
AACSB: Reflective thinking

Objective 1.3

1) Place the four business functions in the order they appear along the value chain:
   - Customer service
   - Design
   - Marketing
   - Production

A) Customer Service, Design, Production, Marketing
B) Customer Service, Marketing, Production, Design
C) Design, Production, Marketing, Customer Service
D) Design, Customer Service, Production, Marketing

Answer: C
Diff: 2
Terms: value chain
Objective: 3
AACSB: Reflective thinking

2) R&D, production, and customer service are business functions that are all included as part of:
   A) the value chain
   B) benchmarking
   C) marketing
   D) the supply chain

Answer: A
Diff: 1
Terms: value chain
Objective: 3
AACSB: Analytical skills
3) The value chain is the sequence of business functions in which:
A) value is deducted from the products or services of an organization
B) value is proportionately added to the products or services of an organization
C) products and services are evaluated with respect to their value to the supply chain
D) usefulness is added to the products or services of an organization
Answer: D
Diff: 2
Terms: value chain
Objective: 3
AACSB: Reflective thinking

4) ________ is the generation of, and experimentation with, ideas related to new products, services, or processes.
A) Research and development
B) Design of products, services, or processes
C) Production
D) Marketing
Answer: A
Diff: 1
Terms: research and development
Objective: 3
AACSB: Analytical skills

5) ________ is the detailed planning and engineering of products, services, or processes.
A) Distribution
B) Design of products, services, or processes
C) Production
D) Marketing
Answer: B
Diff: 1
Terms: design of products, services, or processes
Objective: 3
AACSB: Reflective thinking

6) ________ is the acquisition, coordination, and assembly of resources to produce a product or deliver a service.
A) Research and development
B) Customer service
C) Production
D) Marketing
Answer: C
Diff: 1
Terms: production
Objective: 3
AACSB: Reflective thinking
7) _______ is the manner by which companies promote and sell their products or services to customers or perspective customers.
A) Distribution  
B) Customer service  
C) Research and development  
D) Marketing  
Answer: D  
Diff: 1  
Terms: marketing  
Objective: 3  
AACSB: Reflective thinking

8) _______ is the delivery of products or services to customers.
A) Distribution  
B) Customer service  
C) Production  
D) Design of products, services, or processes  
Answer: A  
Diff: 1  
Terms: distribution  
Objective: 3  
AACSB: Reflective thinking

9) _______ is the after-sale support provided to customers.
A) Distribution  
B) Customer service  
C) Production  
D) Marketing  
Answer: B  
Diff: 1  
Terms: customer service  
Objective: 3  
AACSB: Reflective thinking

10) _______ is a strategy that integrates people and technology in all business functions to enhance relationships with customers, partners, and distributors.
A) Supply-chain analysis  
B) Customer relationship management  
C) Value-chain analysis  
D) Continuous quality improvement  
Answer: B  
Diff: 1  
Terms: customer relationship management  
Objective: 3  
AACSB: Use of Information Technology
11) Customer relationship management initiatives use technology to coordinate all:
A) production activities
B) research activities
C) customer-facing activities
D) inventory management activities
Answer: C
Diff: 1
Terms: customer relationship management
Objective: 3
AACSB: Use of Information Technology

12) ________ describe(s) the flow of goods, services, and information from the purchase of materials to
the delivery of products to consumers, regardless of whether those activities occur in the same
organization or with other organizations.
A) Supply chain
B) Key success factors
C) Continuous improvement
D) Customer focus
Answer: A
Diff: 1
Terms: supply chain
Objective: 3
AACSB: Reflective thinking

13) Processing orders and shipping products or services to customers (also
called outbound logistics) is also known as
A) customer focus
B) distribution
C) marketing
D) supply chain
Answer: B
Diff: 2
Terms: value chain
Objective: 3
AACSB: Reflective thinking

14) ________ is a philosophy in which management improves operations throughout the value chain to
deliver products and services that exceed customer expectations.
A) Cost-benefit approach
B) Customer focus
C) Customer relationship management
D) Total quality management
Answer: D
Diff: 2
Terms: quality
Objective: 3
AACSB: Reflective thinking
15) Which item is NOT an area that customers want to see improved levels of performance in?
A) innovation
B) quality
C) cost and efficiency
D) profit
Answer: D
Diff: 2
Terms: supply chain
Objective: 3
AACSB: Reflective thinking

16) Which of the following statements about a company's supply chain is true?
A) A company's supply chain is always internal to a firm.
B) A company's supply chain is always external to a firm.
C) A company's supply chain is the same thing as a company's value chain.
D) Management accountants provide information to enhance a company's supply chain.
Answer: D
Diff: 1
Terms: supply chain
Objective: 3
AACSB: Communication

17) ________ describes the flow of goods, services, and information from the initial sources of materials and services to the delivery of products to consumers, regardless of whether those activities occur in the same organization or in other organizations.
A) The value chain
B) The supply chain
C) Product differentiation
D) Distribution
Answer: B
Diff: 2
Terms: total quality management (TQM)
Objective: 3
AACSB: Reflective thinking

18) Whose perceptions of the company's products or services are the most important to the manager?
A) board of directors' perception
B) customers' perception
C) president's perception
D) stockholders' perception
Answer: B
Diff: 2
Terms: total quality management (TQM)
Objective: 3
AACSB: Reflective thinking
19) ________ aims to improve operations throughout the value chain and to deliver products and services that exceed customer expectations.
A) Total Quality Management
B) Innovation
C) Customer response time
D) Cost and efficiency
Answer: A
Diff: 2
Terms: total quality management (TQM)
Objective: 3
AACSB: Reflective thinking

20) Customers are demanding improved performance related to:
A) reduced costs
B) both reduced costs and increased quality
C) lower costs, improved quality, and improved customer service
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: total quality management (TQM)
Objective: 3
AACSB: Analytical skills

21) Customer response time involves:
A) the speed it takes a customer to respond to an advertisement and place an order
B) the speed at which an organization responds to customer requests
C) the speed it takes to develop a new product
D) the speed it takes an organization to develop a Total Quality Management (TQM) program
Answer: B
Diff: 2
Terms: total quality management (TQM)
Objective: 3
AACSB: Reflective thinking

22) Which of the following is NOT a way for a company to improve customer response time?
A) Increase capacity of bottleneck operations.
B) Purchase material in larger quantities.
C) Use faster delivery procedures.
D) Produce the product more quickly.
Answer: B
Diff: 2
Terms: total quality management (TQM)
Objective: 3
AACSB: Analytical skills
23) The supply chain refers to the sequence of business functions in which customer usefulness is added to products or services.
Answer: FALSE
Explanation: The value chain refers to the sequence of business functions in which customer usefulness is added to products or services.
Diff: 1
Terms: supply chain
Objective: 3
AACSB: Reflective thinking

24) An effective way to cut costs is to eliminate activities that do NOT improve the product attributes that customers value.
Answer: TRUE
Diff: 1
Terms: cost management
Objective: 3
AACSB: Reflective thinking

25) For optimal planning success it is best if each business function within the value chain is performed one at a time in sequence.
Answer: FALSE
Explanation: Optimally, success is achieved when two or more of the individual business functions work concurrently as a team.
Diff: 1
Terms: value chain
Objective: 3
AACSB: Analytical skills

26) For best results, cost management emphasizes independently coordinating supply chain activities within your company and with other companies that act as suppliers and customers.
Answer: TRUE
Diff: 2
Terms: cost management
Objective: 3
AACSB: Analytical skills

27) Technological innovation has led to longer product-life cycles and lessened the need to bring new products to market more rapidly.
Answer: FALSE
Explanation: Technological innovation has led to shorter product-life cycles and increased the need to bring new products to market more rapidly.
Diff: 1
Terms: design of products, services, or processes
Objective: 3
AACSB: Use of Information Technology
28) Key success factors include cost, quality, timeliness, and innovation.
Answer: TRUE
Diff: 1
Terms: value chain
Objective: 3
AACSB: Reflective thinking

29) Customers are demanding increased levels of performance in all aspects of the value chain and the supply chain.
Answer: TRUE
Diff: 1
Terms: value chain
Objective: 3
AACSB: Analytical skills

30) The supply chain describes the flow of goods, services, and information from the initial sources of materials and services to the delivery of products to consumers.
Answer: FALSE
Explanation: The value chain describes the flow of goods, services, and information from the initial sources of materials and services to the delivery of products to consumers.
Diff: 1
Terms: value chain
Objective: 3
AACSB: Reflective thinking

31) The supply chain always occurs within a single organization.
Answer: FALSE
Explanation: The supply chain can include organizations external to a single organization.
Diff: 1
Terms: supply chain
Objective: 3
AACSB: Analytical skills

32) Distribution refers to promoting and selling products or services to customers or prospective customers.
Answer: FALSE
Explanation: Marketing refers to promoting and selling products or services to customers or prospective customers.
Diff: 1
Terms: distribution
Objective: 3
AACSB: Communication
33) The production component of the value chain refers detailed planning, engineering, and testing of products and processes.
Answer: FALSE
Explanation: The design of products, services, and processes component of the value chain refers detailed planning, engineering, and testing of products and processes.
Diff: 1
Terms: design of products, services, or processes
Objective: 3
AACSB: Reflective thinking

34) Management accountants might provide information on decisions on whether to buy a product from outside or manufacture it in-house.
Answer: TRUE
Diff: 1
Terms: cost-benefit approach
Objective: 3
AACSB: Communication

35) Key success factors are geared to improving customer satisfaction.
Answer: TRUE
Diff: 2
Terms: value chain
Objective: 3
AACSB: Analytical skills

36) Value chain refers to its value to the employee.
Answer: FALSE
Explanation: Value chain refers to its value to the customer.
Diff: 1
Terms: value chain
Objective: 3
AACSB: Reflective thinking

37) Companies have to follow strict guidelines when designing a management accounting system.
Answer: FALSE
Explanation: The design of a management accounting system should be guided by the challenges facing managers.
Diff: 1
Terms: treasury
Objective: 3
AACSB: Analytical skills
38) Tracking what is happening in other companies is illegal.
Answer: FALSE
Explanation: Tracking what is happening in other companies alerts managers to changes in their industry and can be accomplished in many legal ways such as visiting competitor's Web sites and reviewing their financial statements.
Diff: 1
Terms: total quality management (TQM)
Objective: 3
AACSB: Analytical skills

39) Increased global competition is placing pressure on companies to reduce costs.
Answer: TRUE
Diff: 1
Terms: total quality management (TQM)
Objective: 3
AACSB: Analytical skills

40) The increasing pace of technological innovation has resulted in shorter product life cycles.
Answer: TRUE
Explanation: The increasing pace of technological innovation has resulted in shorter product lifecycles.
Diff: 1
Terms: total quality management (TQM)
Objective: 3
AACSB: Analytical skills

41) A bottleneck occurs when the work to be performed exceeds the available capacity.
Answer: TRUE
Diff: 1
Terms: cost management
Objective: 3
AACSB: Reflective thinking

42) Classify each cost item into one of the business functions of the value chain, either (1) R&D, (2) design, (3) production, (4) marketing, (5) distribution, or (6) customer service.

Item:
a. cost of samples mailed to promote sales of a new product
b. labor cost of workers in the manufacturing plant
c. bonus paid to a person with a 90% satisfaction rating in handling customers with complaints
d. transportation costs for shipping products to retail outlets
Answer:
a. (4) marketing
b. (3) production
c. (6) customer service
d. (5) distribution
Diff: 2
Terms: value chain
Objective: 3
AACSB: Analytical skills
43) Classify each cost item of Ripon Printers into one of the business functions of the value chain, either (1) R&D, (2) design, (3) production, (4) marketing, (5) distribution, or (6) customer service.

**Item:**

a. cost of customer order forms
b. cost of paper used in manufacture of books
c. cost of paper used in packing cartons to ship books
d. cost of paper used in display at national trade show
e. depreciation of trucks used to transport books to college bookstores
f. cost of the wood used to manufacture paper
g. salary of the scientists attempting to find another source of printing ink
h. cost of defining the book size so that a standard-sized box is filled to capacity

Answer:

a. (4) marketing
b. (3) production
c. (5) distribution
d. (4) marketing
e. (5) distribution
f. (3) production
g. (1) research and development
h. (2) design

Diff: 2
Terms: value chain
Objective: 3
AACSB: Analytical skills

44) Describe the value chain and how it can help organizations become more effective.

Answer: A value chain is a sequence of business functions whose objective is to provide a product to a customer or provide an intermediate good or service in a larger value chain. These business functions include R&D, design, production, marketing, distribution, and customer service.

An organization can become more effective by focusing on whether each link in the chain adds value from the customer's perspective and furthers the organization's objectives.

Diff: 3
Terms: value chain
Objective: 3
AACSB: Reflective thinking
45) **Value chain and classification of costs, car company.**

General Motors incurs the following costs:

- **a.** Electricity costs for the plant assembling the Chevrolet Camaro
- **b.** Transportation costs for shipping the Camaro to dealers
- **c.** Payment to Shelby Designs for the design of the Camaro.
- **d.** Salary of an engineer working on the next generation of Camaros
- **e.** Cost of GM employees' visit to an auto show to demonstrate the Camaro
- **f.** Testing the Camaro at the GM track
- **g.** Payment to television network for running Camaro advertisements
- **h.** Cost of brake pads purchased from outside supplier to be installed on the Camaro

**Required:**

Classify each of the cost items (a-h) into one of the business functions of the value chain.

1) Research and development
2) Design of products and processes
3) Production
4) Marketing
5) Distribution
6) Customer service

**Answer:**

- **a.** 3) Production
- **b.** 5) Distribution
- **c.** 2) Design of products and processes
- **d.** 1) Research and development
- **e.** 4) Marketing
- **f.** 2) Design of products and processes
- **g.** 4) Marketing
- **h.** 3) Production

Diff: 2

Terms: value chain

Objective: 3

AACSB: Reflective thinking

Objective 1.4

1) Place the five steps in the decision-making process in the correct order:

- A = Obtain information
- B = Make decisions by choosing among alternatives
- C = Identify the problem and uncertainties
- D = Implement the decision
- E = Make predictions about the future

A) C D B E A  
B) E D A B C  
C) C A E B D  
D) A E B D C  

**Answer:** C

Diff: 2

Terms: decision model

Objective: 4

AACSB: Reflective thinking
2) Planning consists of all of these areas EXCEPT:
A) selecting organizational goals
B) deciding how to attain the desired goals
C) evaluating performance
D) predicting results under various alternatives
Answer: C
Diff: 2
Terms: planning
Objective: 4
AACSB: Reflective thinking

3) The most important planning tool is a ________.
A) performance evaluation report
B) balanced scorecard
C) goal
D) budget
Answer: D
Diff: 2
Terms: budget
Objective: 4
AACSB: Analytical skills

4) A report showing the actual financial results for a period compared to the budgeted financial results for that same period would most likely be called a:
A) strategic plan
B) management forecast
C) performance report
D) revised plan
Answer: C
Diff: 1
Terms: budget
Objective: 4
AACSB: Reflective thinking

5) The process of preparing a budget:
A) forces coordination and communication across business functions
B) increases accounting efficiencies
C) reduces overcapacity
D) promotes production automation
Answer: A
Diff: 2
Terms: budget
Objective: 4
AACSB: Analytical skills
6) Planning includes all of the following EXCEPT
A) identifying the problem and uncertainties.
B) obtaining information.
C) providing feedback to help with future decision making.
D) making predictions about the future.
Answer: C
Diff: 1
Terms: planning
Objective: 4
AACSB: Reflective thinking

7) A budget:
A) is a quantitative expression of a proposed management plan
B) helps translate strategy into actions
C) aids in the coordination and communication among various business functions
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: budget
Objective: 4
AACSB: Reflective thinking

8) A budget can serve as:
A) a planning tool
B) a control tool
C) a basis for preparing financial statements
D) a planning and control tool
Answer: D
Diff: 1
Terms: budget
Objective: 4
AACSB: Analytical skills

9) Employees ________ how their performance is measured.
A) pay close attention to
B) pay no attention to
C) rarely know
D) None of the above are correct.
Answer: A
Diff: 1
Terms: control
Objective: 4
AACSB: Reflective thinking
10) Linking rewards to performance:
A) helps to motivate managers
B) allows companies to charge premium prices
C) should only be based on financial information
D) All of these answers are correct.
Answer: A
Diff: 2
Terms: control
Objective: 4
AACSB: Analytical skills

11) Control measures should:
A) be set and not changed until the next budget cycle
B) be flexible to allow for employees who are slackers
C) be kept confidential from employees so that competitors don't have an opportunity to gain a competitive advantage
D) be linked by feedback to planning
Answer: D
Diff: 2
Terms: control
Objective: 4
AACSB: Reflective thinking

12) A well-conceived plan allows managers the ability to:
A) not make decisions again until the next planning session
B) keep lower-level managers from implementing change
C) underestimate costs so that actual operating results will be favorable when comparisons are made
D) take advantage of unforeseen opportunities
Answer: D
Diff: 2
Terms: planning
Objective: 4
AACSB: Analytical skills

13) Which of the following statements concerning performance reports is NOT correct?
A) The performance report shows actual performance as compared to the budget.
B) The performance report is a feedback tool.
C) The performance report often leads to more investigations and action.
D) The performance report contains no actual results due to confidentiality.
Answer: D
Diff: 2
Terms: budget
Objective: 4
AACSB: Reflective thinking
14) Management accounting is considered most likely to be successful when it:
A) helps creditors evaluate the company’s performance
B) helps investors improve their decisions
C) is timely
D) is relevant and reported annually
Answer: C
Diff: 2
Terms: treasury
Objective: 4
AACSB: Analytical skills

15) The last step in the decision-making process is to make decisions by choosing among alternatives. 
Answer: FALSE
Explanation: The last step in the decision-making process is to implement the decision, evaluate performance, and learn.
Diff: 1
Terms: decision model
Objective: 4
AACSB: Reflective thinking

16) One of the steps in planning is making predictions about the future. 
Answer: TRUE
Diff: 1
Terms: planning
Objective: 4
AACSB: Reflective thinking

17) It is difficult to control activities without a budget. 
Answer: TRUE
Diff: 1
Terms: budget
Objective: 4
AACSB: Analytical skills

18) To take advantage of changing market opportunities, the annual budget should be strictly enforced. 
Answer: FALSE
Explanation: To take advantage of changing market opportunities, the annual budget should be updated to reflect those changes.
Diff: 2
Terms: budget
Objective: 4
AACSB: Analytical skills

19) A budget is a quantitative expression of a plan. 
Answer: TRUE
Diff: 2
Terms: budget
Objective: 4
AACSB: Reflective thinking
20) The process of preparing a budget forces coordination and communication throughout the company.
Answer: TRUE
Diff: 1
Terms: budget
Objective: 4
AACSB: Communication

21) Linking rewards to performance is a major deterrent to good management performance.
Answer: FALSE
Explanation: Linking rewards to performance helps to motivate good management performance.
Diff: 1
Terms: control
Objective: 4
AACSB: Analytical skills

22) Employees pay little attention to how their performance is measured.
Answer: FALSE
Explanation: Employees are very aware of how their performance is measured.
Diff: 1
Terms: feedback
Objective: 4
AACSB: Analytical skills

23) A budget may be used as a planning tool, but NOT as a control tool.
Answer: FALSE
Explanation: A budget may be used as a planning tool and also as a control tool.
Diff: 1
Terms: budget
Objective: 4
AACSB: Reflective thinking

24) Financial accounting reports financial and non financial information that helps managers implement company strategies.
Answer: FALSE
Explanation: Management accounting reports financial and nonfinancial information that helps managers implement company strategies.
Diff: 1
Terms: financial accounting
Objective: 4
AACSB: Reflective thinking

25) Feedback and learning helps in the future decision-making process.
Answer: TRUE
Diff: 1
Terms: control
Objective: 4
AACSB: Communication
26) Control includes deciding what feedback to provide that will help with future decision making.
Answer: TRUE
Diff: 1
Terms: control
Objective: 4
AACSB: Communication

27) When a particular aspect of employee performance is measured, employees pay more attention to it.
Answer: TRUE
Diff: 2
Terms: learning
Objective: 4
AACSB: Analytical skills

28) A performance report compares actual performance to the amount budgeted.
Answer: TRUE
Diff: 1
Terms: budget
Objective: 4
AACSB: Reflective thinking

29) Management accounting is playing an increasingly important role by helping managers develop and implement strategy.
Answer: TRUE
Diff: 1
Terms: management accounting, strategy
Objective: 4
AACSB: Reflective thinking

30) In order, list the five steps in the decision-making process.
Answer:
1. Identify the problem and uncertainties
2. Obtain information
3. Make predictions about the future
4. Make decisions by choosing among alternatives
5. Implement the decision, evaluate performance, and learn
Diff: 2
Terms: decision model
Objective: 4
AACSB: Analytical skills
31) For each type of report listed below, identify one planning decision and one controlling decision for which the information would be helpful. Assume you are a Walgreen Company store.

**Item:**

a. annual financial statements for the past three years
b. report detailing sales by department by each hour of the day for the past week
c. special study regarding increased road traffic due to the construction of a new shopping mall at a near-by intersection

**Answer:** Please note that answers will vary, but may include the following:

a. Planning: Decision by shareholder about whether to purchase more stock in the company.  
   Control: Decision by bank to determine if financial ratios maintained in the line-of-credit (LOC) agreement warrant increasing the LOC amount.

   Control: Decision regarding whether the recent sales promotion led to an increase in revenue.

c. Planning: Decision of the store manager about whether to change the types of retail items carried.  
   Control: Decision of the store manager regarding performance of the analyst that prepared the special study.

**Diff:** 3  
**Terms:** planning, control  
**Objective:** 4  
**AACSB:** Analytical skills

32) Briefly explain the planning and control activities in management accounting. How are these two activities linked to each other?

**Answer:** Planning business operations relates to designing, producing, and marketing a product or service. This includes preparing budgets and determining the prices and cost of products and services. A company must know the cost of each product and service to decide which products to offer and whether to expand or discontinue product lines.

Controlling business operations includes comparing actual results to the budgeted results and taking corrective action when needed.

Feedback links planning and control. The control function provides information to assist in better future planning.

**Diff:** 2  
**Terms:** planning, control  
**Objective:** 4  
**AACSB:** Reflective thinking
33) Explain how a budget can help management implement strategy.
Answer: A budget is a planning tool, a quantitative expression of a plan of action. First, actions are planned and then they are communicated to the entire organization.

The budget also helps with coordination.
Diff: 3
Terms: budget
Objective: 4
AACSB: Reflective thinking

34) Explain how a customer focus can result in increased profits for a company.
Answer: If customers who provide a company with the most profits are attracted, satisfied, and retained, profits will increase as a result.
Diff: 3
Terms: total quality management (TQM)
Objective: 4
AACSB: Reflective thinking

35) Complete a performance report for the month of May, 2011, for the Daily Bulletin, a regional newspaper showing four columns: 1) Actual Result; 2) Budgeted Amount; 3) Difference: Actual Result minus Budgeted Amount; 4) Difference as a Percentage of Budgeted Amount, given the following data:

<table>
<thead>
<tr>
<th>Actual pages sold</th>
<th>550</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted advertising pages</td>
<td>500</td>
</tr>
<tr>
<td>Actual Advertising revenue</td>
<td>$3,850,000</td>
</tr>
<tr>
<td>Budgeted Advertising revenue</td>
<td>$4,000,000</td>
</tr>
</tbody>
</table>

Does the report indicate any cause for managerial investigation?
Answer: The performance report should look something like the following:

<table>
<thead>
<tr>
<th></th>
<th>Actual Result (1)</th>
<th>Budgeted Amount (2)</th>
<th>Difference (Actual Result - Budgeted Amount) (3) = (1) - (2)</th>
<th>Difference as a Percentage of Budgeted Amount (4) = (3) / (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advertising pages sold</td>
<td>550 pages</td>
<td>500 pages</td>
<td>50 pages Favorable</td>
<td>10.00% Favorable</td>
</tr>
<tr>
<td>Average rate per page (Advertising Revenues) / (Advertising pages sold)</td>
<td>$7,000</td>
<td>$8,000</td>
<td>$1,000 Unfavorable</td>
<td>12.50% Unfavorable</td>
</tr>
<tr>
<td>Advertising revenues</td>
<td>$3,850,000</td>
<td>$4,000,000</td>
<td>$150,000 Unfavorable</td>
<td>3.75% Unfavorable</td>
</tr>
</tbody>
</table>

The overall 3.75% unfavorable difference in advertising revenue is caused by offsetting differences in advertising pages sold (favorable) and the average rate per page (unfavorable). The performance report highlights the favorable increase in the advertising pages sold. While the percentage drop in advertising revenue per page is also dramatic, management might want to investigate the reasons behind such a drop. Some possibilities include: aggressive price reductions to obtain revenue, or some aggressive competition, or an unrealistic budget.

Diff: 3  
Terms: budget  
Objective: 4  
AACSB: Analytical skills

Objective 1.5

1) Which item is NOT a guideline used by management accountants to assist in strategic and operational decision making?  
A) cost-benefit approach  
B) behavioral and technical considerations  
C) different costs for different purposes  
D) balanced scorecard  
Answer: D  
Diff: 2  
Terms: treasury  
Objective: 5  
AACSB: Reflective thinking
2) The scenario that resources should be spent if the expected benefits to the company exceed the expected costs describes:
A) cost-benefit approach
B) behavioral and technical considerations
C) balanced scorecard
D) different costs for different purposes
Answer: A
Diff: 2
Terms: cost-benefit approach
Objective: 5
AACSB: Reflective thinking

3) The act of simply measuring and reporting information:
A) focuses the attention of employees on those processes
B) diverts employee's attention to other activities
C) disproves the saying "What gets measured gets managed."
D) has no effect on employee behavior
Answer: A
Diff: 2
Terms: control, learning
Objective: 5
AACSB: Analytical skills

4) Which statement is true?
A) Management is primarily a technical activity.
B) People do not react to measurements.
C) Employees spend more attention on those variables that are getting measured.
D) Resources should be spent if the expected benefits to the company are less than the expected costs.
Answer: C
Diff: 2
Terms: control, learning
Objective: 5
AACSB: Analytical skills

5) The primary criterion when faced with a resource allocation decision is:
A) cost minimization
B) reduction in the amount of time required to perform a particular job
C) achievement of organizational goals
D) how well the alternative options help achieve organizational goals in relation to the costs incurred for these systems
Answer: D
Diff: 3
Terms: cost-benefit approach
Objective: 5
AACSB: Analytical skills
6) Which of the following statements about the cost-benefit approach is true?
A) Resources should be spent if they are expected to better attain company goals in relation to the expected costs of these resources.
B) In a cost-benefit analysis, both costs and benefits are easy to obtain.
C) Resources should be spent if the costs of a decision outweigh the benefits of the decision.
D) A cost-benefit approach would not be appropriate for a decision to install a budget system or not.
Answer: A
Diff: 2
Terms: cost-benefit approach
Objective: 5
AACSB: Reflective thinking

7) It is generally easy to quantify expected benefits and costs when applying the cost-benefit approach.
Answer: FALSE
Explanation: It is challenging and generally costly to quantify expected benefits and costs when applying the cost-benefit approach.
Diff: 2
Terms: cost-benefit approach
Objective: 5
AACSB: Analytical skills

8) The technical considerations of budgeting encourage managers and other employees to strive for achieving the goals of the organization.
Answer: FALSE
Explanation: The behavioral considerations of budgeting encourage managers and other employees to strive for achieving the goals of the organization.
Diff: 2
Terms: budget
Objective: 5
AACSB: Reflective thinking

9) A cost concept used for external reporting purposes may not be appropriate for internal, routine reporting to managers.
Answer: TRUE
Diff: 2
Terms: cost accounting, financial accounting
Objective: 5
AACSB: Analytical skills

10) Accounting method for internal reporting purposes are specified by Generally Accepted Accounting Principles (GAAP).
Answer: FALSE
Explanation: Accounting methods for internal reporting are not specified by Generally Accepted Accounting principles (GAAP)
Diff: 2
Terms: treasury
Objective: 5
AACSB: Reflective thinking
11) Discuss the cost-benefit approach guideline management accountants use to provide value in strategic decision making.
Answer: Management accountants continually face resource allocation decisions. The cost-benefit approach should be used in making these decisions. Resources should be spent if the expected benefits to the company exceed the expected costs. The expected benefits and costs may not be easy to quantify, but it is a useful approach for making resource allocation decisions.
Diff: 3
Terms: cost-benefit approach
Objective: 5
AACSB: Reflective thinking

12) Discuss the potential behavior implications of performance evaluation.
Answer: As measurements are made on operations and, especially, on individuals and groups, the behavior of the individuals and groups are affected. People react to the measurements being made. They will focus on those variables or the behavior being measured and spend less attention on variables and behavior that are not measured. In addition, if managers attempt to introduce or redesign cost and performance measurement systems, people familiar with the previous system will resist. Management accountants must understand and anticipate the reactions of individuals to information and measurements. The design and introduction of new measurements and systems must be accompanied with an analysis of the likely reactions to the innovations.
Diff: 3
Terms: control, learning
Objective: 5
AACSB: Reflective thinking

Objective 1.6

1) The person(s) directly responsible for attaining of organizational objectives is/are:
A) the treasurer
B) line management
C) the controller
D) the chief financial officer
Answer: B
Diff: 1
Terms: line management
Objective: 6
AACSB: Reflective thinking

2) The person(s) responsible for providing advice and assistance to line managers is/are:
A) the controller
B) the chief financial officer
C) staff management
D) the treasurer
Answer: C
Diff: 1
Terms: staff management
Objective: 6
AACSB: Reflective thinking
3) ________ includes providing financial information for reports to managers and shareholders, and overseeing the overall operations of the accounting system.
A) Internal audit
B) External audit
C) Controllership
D) Treasury
Answer: C
Diff: 2
Terms: conversion costs
Objective: 6
AACSB: Communication

4) ________ includes banking and short- and long-term financing, investments, and cash management.
A) Risk management
B) Internal audit
C) Controllership
D) Treasury
Answer: D
Diff: 2
Terms: treasury
Objective: 6
AACSB: Analytical skills

5) Line management includes:
A) manufacturing managers
B) human-resource managers
C) information-technology managers
D) management-accounting managers
Answer: A
Diff: 2
Terms: line management
Objective: 6
AACSB: Analytical skills

6) Staff management includes:
A) manufacturing managers
B) human-resource managers
C) purchasing managers
D) distribution managers
Answer: B
Diff: 2
Terms: staff management
Objective: 6
AACSB: Analytical skills
7) Responsibilities of a CFO include all of the following EXCEPT:
A) providing financial reports to shareholders
B) managing short-term and long-term financing
C) investing in new equipment
D) preparing federal, state, and international tax returns
Answer: C

8) The ________ is primarily responsible for management accounting and financial accounting.
A) COO (Chief Operating Officer)
B) CIO (Chief Information Officer)
C) treasurer
D) controller
Answer: D

9) All of the following report to the CFO EXCEPT the:
A) controller
B) tax department manager
C) production manager
D) treasurer
Answer: C

10) Examples of the controller's functions include all EXCEPT:
A) operations administration
B) budgeting
C) investor relations
D) general ledger
Answer: C
11) Long term financing is an integral part of the ________ function in an organization.
A) treasurer's
B) controller's
C) internal audit
D) president's
Answer: A
Diff: 1
Terms: management accounting, controller
Objective: 6
AACSB: Reflective thinking

12) Line management is directly responsible for attaining the goals of the organization.
Answer: TRUE
Diff: 1
Terms: line management
Objective: 6
AACSB: Reflective thinking

13) Staff management should NOT provide advice and assistance to line management.
Answer: FALSE
Explanation: Management accountants, and human-resources managers are examples of staff management.
Diff: 1
Terms: controllership
Objective: 6
AACSB: Communication

14) Treasury includes banking and short- and long-term financing, investments, and cash management.
Answer: TRUE
Diff: 2
Terms: controllership
Objective: 6
AACSB: Analytical skills

15) The controller is usually responsible for banking, short- and long-term financing, investments, and cash management.
Answer: TRUE
Diff: 1
Terms: internal audit
Objective: 6
AACSB: Reflective thinking

16) The controller (also called the chief accounting officer) is the financial executive primarily responsible for both management accounting and financial accounting.
Answer: TRUE
Diff: 1
Terms: internal audit
Objective: 6
AACSB: Reflective thinking
17) An external audit includes reviewing and analyzing financial and other records to attest to the integrity of the organization's financial reports and to adherence to its policies and procedures.  
Answer: FALSE  
Explanation: Internal audit includes reviewing and analyzing financial and other records to attest to the integrity of the organization's financial reports and to adherence to its policies and procedures.  
Diff: 2  
Terms: internal audit  
Objective: 6  
AACSB: Communication

18) The controller is generally a staff position. 
Answer: TRUE  
Diff: 1  
Terms: internal audit  
Objective: 6  
AACSB: Analytical skills

19) Management accountants must have behavioral and interpersonal skills. 
Answer: TRUE  
Diff: 1  
Terms: internal audit  
Objective: 6  
AACSB: Analytical skills

20) What areas of responsibility does a chief financial officer have in a typical organization? 
Answer: The responsibilities vary among organizations, but generally include the following areas: controllership, treasury, risk management, taxation, investor relations, and internal audit.  
Diff: 3  
Terms: chief financial officer (CFO)  
Objective: 6  
AACSB: Reflective thinking

21) How does a controller help "control" a company? 
Answer: By reporting and interpreting relevant data, the controller exerts a force or influence that impels management toward making better-informed decisions. 

The controller of Caterpillar described the job as "a business advisor to ...help the team develop strategy and focus the team all the way through recommendations and implementation."  
Diff: 3  
Terms: internal audit  
Objective: 6  
AACSB: Reflective thinking
Objective 1.7

1) Which of the following issues is NOT addressed by the Sarbanes-Oxley legislation?
A) improving internal control
B) corporate governance
C) disclosure practices of public corporations
D) disclosure practices of private companies
Answer: D
Diff: 1
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning

2) The Standards of Ethical Conduct for management accountants include concepts related to:
A) competence, performance, integrity, and reporting
B) competence, confidentiality, integrity, and credibility
C) experience, integrity, reporting, and objectivity
D) None of these answers are correct.
Answer: B
Diff: 2
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning

3) Which item is NOT an indication of competence under the Standards of Ethical Conduct?
A) Maintain an appropriate level of professional expertise by continually developing knowledge and skills.
B) Keep information confidential except when disclosure is authorized or legally required.
C) Perform professional duties in accordance with relevant laws, regulations, and technical standards.
D) Provide decision support information and recommendations that are accurate, clear, concise, and timely.
Answer: B
Diff: 2
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning

4) Which item is NOT an indication of confidentiality under the Standards of Ethical Conduct?
A) Keep information confidential except when disclosure is authorized or legally required.
B) Inform all relevant parties regarding appropriate use of confidential information.
C) Refrain from using confidential information for unethical or illegal advantage.
D) All of the above indicate confidentiality.
Answer: D
Diff: 2
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning
5) Which item is an indication of integrity under the Standards of Ethical Conduct?
A) Refrain from engaging in any conduct that would prejudice carrying out duties ethically.
B) Communicate information fairly and objectively.
C) Keep information confidential except when disclosure is authorized or legally required.
D) Recognize and communicate professional limitations or other constraints that would preclude responsible judgment or successful performance of an activity.
Answer:  A
Diff: 2
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning

6) Which item is an indication of credibility under the Standards of Ethical Conduct?
A) Maintain an appropriate level of professional expertise by continually developing knowledge and skills.
B) Refrain from using confidential information for unethical or illegal advantage.
C) Abstain from engaging in or supporting any activity that might discredit the profession.
D) Disclose delays or deficiencies in information, timeliness, processing, or internal controls in conformance with organization policy and/or applicable law.
Answer:  D
Diff: 2
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning

7) Ethical challenges for management accountants include:
A) whether to accept gifts from suppliers, knowing it is an effort to indirectly influence decisions
B) whether to report unfavorable department information that may result in unfavorable consequences for a friend
C) whether to file a tax return this year
D) Both A and B are correct.
Answer:  D
Diff: 2
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning

8) Which of the following actions should a management accountant take first in confronting a potential ethical conflict concerning your direct supervisor?
A) Inform the Board of Directors of the existence of a potential conflict.
B) Confront the supervisor directly.
C) Discuss the situation with your supervisor's direct supervisor.
D) Review your organization's procedures concerning resolution of such a conflict.
Answer:  D
Diff: 2
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning
9) If there is an ethical conflict concerning your direct supervisor, you may contact all of the following groups EXCEPT:
A) local media
B) audit committee
C) executive committee
D) board of directors
Answer: A

10) If there is an ethical conflict concerning your direct supervisor, when is it appropriate to contact authorities or individuals NOT employed by the organization?
A) when there is a personal conflict
B) when your supervisor is about to receive a bonus
C) when there is a clear violation of the law
D) when you are about to be terminated
Answer: C

11) Credibility includes maintaining an appropriate level of professional expertise by continually developing knowledge and skills.
Answer: FALSE
Explanation: Competence includes maintaining an appropriate level of professional expertise by continually developing knowledge and skills.

12) The Sarbanes-Oxley legislation does NOT provide a process for employees to report violations of illegal and unethical acts.
Answer: FALSE
Explanation: This legislation does provide employees with the right to report violations.

13) Management accountants have important ethical responsibilities that are related to competence, confidentiality, integrity, and credibility.
Answer: TRUE
14) A managerial accountant should NOT disclose confidential information to an outside party (such as a newspaper) unless legally obligated to do so.
Answer: TRUE
Diff: 1
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning

15) If a managerial accountant were NOT keeping up with current developments in managerial accounting, that behavior might violate a competence standard of professional ethical behavior.
Answer: TRUE
Diff: 1
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning

16) If a managerial accountant suspected his or her immediate superior of wrongdoing, the managerial accountant should request an immediate meeting with the Board of Directors.
Answer: FALSE
Explanation: If a managerial accountant suspected his or her immediate superior of wrongdoing, the managerial accountant should first present the situation to the next higher managerial level.
Diff: 1
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning

17) The Institute of Management Accountants provides a hotline to discuss ethical issues.
Answer: TRUE
Diff: 1
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning

18) When faced with a potential ethical conflict, the managerial accountant should first consult any internal procedures of that organization.
Answer: TRUE
Diff: 1
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning
19) When confronted with a potential ethical conflict, a managerial accountant should not contact his or her personal attorney concerning rights and obligations.
Answer: FALSE
Explanation: When confronted with a potential ethical conflict, a managerial accountant should contact his or her personal attorney concerning rights and obligations.
Diff: 2
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning

20) Integrity includes mitigating actual conflicts of interest, regularly communicating with business associates to avoid apparent conflicts of interest, and advising all parties of any potential conflicts.
Answer: TRUE
Diff: 1
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning

21) List the four standards of ethical conduct for management accountants. For each standard, give an example that demonstrates compliance with that standard.
Answer: Please note that answers may vary, but may include the following:
1. Competence: Maintain an appropriate level of professional expertise by continually developing knowledge and skills
2. Confidentiality: Refrain from using confidential information for unethical or illegal advantage
3. Integrity: Abstain from engaging in or supporting any activity that might discredit the profession
4. Credibility: Communicate information fairly and objectively
Diff: 3
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning

22) You have been employed as an entry-level management accountant for a little under a year. You suspect that your immediate supervisor is involved in a significant fraud involving diverting of company assets to personal use. Briefly describe the steps you might take to resolve this dilemma.
Answer: The management accountant should first consult any internal company procedures concerning the resolution of ethical issues, and make sure these procedures are followed as closely as possible. At the same time, the management accountant should make sure that the facts are accurate, and are not based on rumors or inaccurate information. If these policies do not resolve the situation, present the facts to the next higher managerial level. Clarify the relevant ethical issues with an objective advisor (e.g., Institute of Management Accountants hotline). Consult your own attorney to be aware of your own rights and responsibilities. If all internal review procedures have still not resolved the ethical situation, the managerial accountant might have to resign and write an informative letter to an appropriate representative of the organization, and perhaps notify other parties.
Diff: 3
Terms: professional ethics
Objective: 7
AACSB: Ethical reasoning
Cost Accounting, 14e (Horngren/Datar/Rajan)
Chapter 2  An Introduction to Cost Terms and Purposes

Objective 2.1

1) Cost objects include:
   A) products
   B) customers
   C) departments
   D) All of these answers are correct.
   Answer: D
   Diff: 2
   Terms: cost object
   Objective: 1
   AACSB: Reflective thinking

2) Actual costs are:
   A) the costs incurred
   B) budgeted costs
   C) estimated costs
   D) forecasted costs
   Answer: A
   Diff: 1
   Terms: actual costing
   Objective: 1
   AACSB: Reflective thinking

3) The general term used to identify both the tracing and the allocation of accumulated costs to a cost object is:
   A) cost accumulation
   B) cost assignment
   C) cost tracing
   D) conversion costing
   Answer: B
   Diff: 1
   Terms: cost assignment
   Objective: 1
   AACSB: Reflective thinking

4) In order to make decisions, managers need to know:
   A) actual costs
   B) budgeted costs
   C) both costs
   D) neither cost
   Answer: C
   Diff: 1
   Terms: budgeted costs
   Objective: 1
   AACSB: Ethical reasoning
5) The collection of accounting data in some organized way is:
A) cost accumulation
B) cost assignment
C) cost tracing
D) conversion costing
Answer: A
Diff: 1
Terms: cost accumulation
Objective: 1
AACSB: Reflective thinking

6) Budgeted costs are:
A) the costs incurred this year
B) the costs incurred last year
C) planned or forecasted costs
D) competitor's costs
Answer: C
Diff: 2
Terms: budgeted costs
Objective: 1
AACSB: Reflective thinking

7) Cost assignment:
A) is always arbitrary
B) is includes tracing and allocating
C) is the same as cost accumulation
D) is finding the difference between budgeted and actual costs
Answer: B
Diff: 2
Terms: cost assignment
Objective: 1
AACSB: Reflective thinking

8) A cost system determines the cost of a cost object by:
A) accumulating and then assigning costs
B) accumulating costs
C) assigning and then accumulating costs
D) assigning costs
Answer: A
Diff: 2
Terms: cost accumulation
Objective: 1
AACSB: Reflective thinking
9) Products, services, departments, and customers may be cost objects.
Answer: TRUE
Diff: 1
Terms: cost object
Objective: 1
AACSB: Reflective thinking

10) Costs are accounted for in two basic stages: assignment followed by accumulation.
Answer: FALSE
Explanation: Costs are accounted for in two basic stages: accumulation followed by assignment.
Diff: 1
Terms: cost accumulation
Objective: 1
AACSB: Reflective thinking

11) Actual costs and historical costs are two different terms referring to the same thing.
Answer: TRUE
Diff: 1
Terms: budgeted costs
Objective: 1
AACSB: Reflective thinking

12) Accountants define a cost as a resource to be sacrificed to achieve a specific objective.
Answer: TRUE
Diff: 1
Terms: cost
Objective: 1
AACSB: Reflective thinking

13) A cost object is always either a product or a service.
Answer: FALSE
Explanation: A cost object could be anything management wishes to determine the cost of, for example, a department.
Diff: 2
Terms: cost object
Objective: 1
AACSB: Reflective thinking

14) A customer could be considered a cost object.
Answer: TRUE
Diff: 2
Terms: cost object
Objective: 1
AACSB: Analytical skills
15) Lucas Manufacturing has three cost objects that it uses to accumulate costs for its manufacturing plants. They are:

- **Cost object #1**: The physical buildings and equipment
- **Cost object #2**: The use of buildings and equipment
- **Cost object #3**: The availability and use of manufacturing labor

The following manufacturing overhead cost categories are found in the accounting records:

- a. Depreciation on buildings and equipment
- b. Lubricants for machines
- c. Property insurance
- d. Supervisors salaries
- e. Fringe benefits
- f. Property taxes
- g. Utilities

**Required:**
Assign each of the above costs to the most appropriate cost object.

**Answer:**
Cost object # 1 includes categories a, c, and f.

Cost object # 2 includes categories b and g.

Cost object # 3 includes categories d and e.

**Diff: 2**  
**Terms:** cost object  
**Objective:** 1  
**AACSB:** Analytical skills

1) Which of the following does NOT affect the direct/indirect classification of a cost?  
A) the level of budgeted profit for the next year  
B) the materiality of the cost in question  
C) available technology to gather information about the cost  
D) the design of the operation  
**Answer:** A  
**Diff: 2**  
**Terms:** direct costs of a cost object, indirect costs of a cost object  
**Objective:** 2  
**AACSB:** Analytical skills
2) Which of the following statements about the direct/indirect cost classification is NOT true?
A) Indirect costs are always traced.  
B) Indirect costs are always allocated.  
C) The design of operations affects the direct/indirect classification.  
D) The direct/indirect classification depends on the choice of cost object.  
Answer: A  
Diff: 2  
Terms: indirect manufacturing costs, cost allocation  
Objective: 2  
AACSB: Analytical skills

3) Cost tracing is:  
A) the assignment of direct costs to the chosen cost object  
B) a function of cost allocation  
C) the process of tracking both direct and indirect costs associated with a cost object  
D) the process of determining the actual cost of the cost object  
Answer: A  
Diff: 2  
Terms: cost tracing  
Objective: 2  
AACSB: Reflective thinking

4) Cost allocation is:  
A) the process of tracking both direct and indirect costs associated with a cost object  
B) the process of determining the actual cost of the cost object  
C) the assignment of indirect costs to the chosen cost object  
D) a function of cost tracing  
Answer: C  
Diff: 2  
Terms: cost allocation  
Objective: 2  
AACSB: Reflective thinking

5) The determination of a cost as either direct or indirect depends upon the:  
A) accounting system  
B) allocation system  
C) cost tracing system  
D) cost object chosen  
Answer: D  
Diff: 2  
Terms: direct costs of a cost object, indirect costs of a cost object  
Objective: 2  
AACSB: Reflective thinking
6) Classifying a cost as either direct or indirect depends upon:
A) the behavior of the cost in response to volume changes
B) whether the cost is expensed in the period in which it is incurred
C) whether the cost can be easily identified with the cost object
D) whether an expenditure is avoidable or not in the future
Answer: C
Diff: 2
Terms: direct costs of a cost object, indirect costs of a cost object
Objective: 2
AACSB: Reflective thinking

7) A manufacturing plant produces two product lines: golf equipment and soccer equipment. An example of direct costs for the golf equipment line are:
A) beverages provided daily in the plant break room
B) monthly lease payments for a specialized piece of equipment needed to manufacture the golf driver
C) salaries of the clerical staff that work in the company administrative offices
D) utilities paid for the manufacturing plant
Answer: B
Diff: 2
Terms: direct costs of a cost object
Objective: 2
AACSB: Analytical skills

8) A manufacturing plant produces two product lines: golf equipment and soccer equipment. An example of indirect cost for the soccer equipment line is:
A) material used to make the soccer balls
B) labor to shape the leather used to make the soccer ball
C) shift supervisor for the soccer line
D) plant supervisor
Answer: D
Diff: 2
Terms: indirect costs of a cost object
Objective: 2
AACSB: Analytical skills

9) Which one of the following items is a direct cost?
A) Customer-service costs of a multiproduct firm; Product A is the cost object.
B) Printing costs incurred for payroll check processing; payroll check processing is the cost object.
C) The salary of a maintenance supervisor in a multiproduct manufacturing plant; Product B is the cost object.
D) Utility costs of the administrative offices; the accounting department is the cost object.
Answer: B
Diff: 2
Terms: direct costs of a cost object
Objective: 2
AACSB: Reflective thinking
10) Indirect manufacturing costs:
A) can be traced to the product that created the costs
B) can be easily identified with the cost object
C) generally include the cost of material and the cost of labor
D) may include both variable and fixed costs
Answer: D
Diff: 2
Terms: indirect manufacturing costs
Objective: 2
AACSB: Reflective thinking

11) All of the following are true EXCEPT that indirect costs:
A) may be included in prime costs
B) are not easily traced to products or services
C) vary with the selection of the cost object
D) may be included in manufacturing overhead
Answer: A
Diff: 2
Terms: indirect manufacturing costs
Objective: 2
AACSB: Reflective thinking

12) Which statement is true?
A) All variable costs are direct costs.
B) Because of a cost-benefit tradeoff, some direct costs may be treated as indirect costs.
C) All fixed costs are indirect costs.
D) All direct costs are variable costs.
Answer: B
Diff: 3
Terms: variable costs, fixed costs, indirect costs of a cost object
Objective: 2
AACSB: Reflective thinking

13) Which statement is true?
A) A direct cost of one cost object cannot be an indirect cost of another cost object.
B) All variable costs are direct costs.
C) A direct cost of one cost object can be an indirect cost of another cost object.
D) All fixed costs are direct costs.
Answer: C
Diff: 3
Terms: direct costs, indirect costs
Objective: 2
AACSB: Reflective thinking
14) The same cost may be direct for one cost object and indirect for another cost object.
Answer: TRUE
Diff: 3
Terms: cost object
Objective: 2
AACSB: Analytical skills

15) Assigning direct costs poses more problems than assigning indirect costs.
Answer: FALSE
Explanation: Tracing direct costs is quite straightforward, whereas assigning indirect costs to a number of different cost objects can be very challenging.
Diff: 2
Terms: direct costs of a cost object, indirect costs of a cost object
Objective: 2
AACSB: Analytical skills

16) Improvements in information-gathering technologies are making it possible to trace more costs as direct.
Answer: TRUE
Diff: 2
Terms: direct costs of a cost object
Objective: 2
AACSB: Use of Information Technology

17) Misallocated indirect costs may lead to NOT promoting profitability.
Answer: TRUE
Diff: 2
Terms: cost allocation
Objective: 2
AACSB: Analytical skills

18) The materiality of the cost is a factor in classifying the cost as a direct or indirect cost.
Answer: TRUE
Diff: 2
Terms: direct costs of a cost object, indirect costs of a cost object
Objective: 2
AACSB: Reflective thinking

19) The cost of electricity used in the production of multiple products would be classified as an indirect cost.
Answer: TRUE
Diff: 1
Terms: direct costs of a cost object
Objective: 2
AACSB: Analytical skills
20) Some fixed costs may be classified as direct manufacturing costs.
Answer: TRUE
Diff: 1
Terms: fixed costs, direct costs of a cost object
Objective: 2
AACSB: Analytical skills

21) The distinction between direct and indirect costs is clearly set forth in Generally Accepted Accounting Principles (GAAP).
Answer: FALSE
Explanation: The distinction between direct and indirect costs is not set forth in GAAP. Direct costs of a cost object are related to the particular cost object and can be traced to it in an economically feasible (cost-effective) way. Indirect costs of a cost object are related to the particular cost object but cannot be traced to it in an economically feasible (cost-effective) way.
Diff: 2
Terms: direct costs of a cost object, indirect costs of a cost object
Objective: 2
AACSB: Reflective thinking

22) Archambeau Products Company manufactures office furniture. Recently, the company decided to develop a formal cost accounting system and classify all costs into three categories. Categorize each of the following items as being appropriate for (1) cost tracing to the finished furniture, (2) cost allocation of an indirect manufacturing cost to the finished furniture, or (3) as a nonmanufacturing item.

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost Tracing</th>
<th>Cost Allocation</th>
<th>Nonmanufacturing</th>
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<td>Carpenter wages</td>
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<td>Depreciation - office building</td>
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<td>Samples for trade shows</td>
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23) Why is it possible that a raw material such as glue might be considered as an indirect material for one furniture manufacturer and as a direct material for another furniture manufacturer?

Answer: It is possible for a raw material such as glue to be considered as an indirect material by one furniture manufacturer and as a direct material by another furniture manufacturer. The decision is largely a choice by the manufacturer and depends on a number of factors including the materiality of the cost in question, the cost of gathering the information, and the design of the manufacturing process. If the product in question has an insignificant cost, it might not be worth the trouble to trace the cost of the glue to each piece of furniture, and the glue would be considered indirect. If the cost of tracing the cost of the glue is high in relation to the benefits received from tracing it, the glue would likely be considered as indirect material. If the design of the manufacturing process easily permits all the glue to be traced to a single type of furniture, then it would be easy for a company to consider that material to be direct. Overall, the direct/indirect classification is decided on a cost/benefit basis.

Diff: 3
Terms: direct material
Objective: 2
AACSB: Reflective thinking

24) What are the differences between direct costs and indirect costs? Give an example of each.

Answer: Direct costs are costs that can be traced easily to the product manufactured or the service rendered. Examples of direct costs include direct materials and direct manufacturing labor used in a product. Indirect costs cannot be easily identified with individual products or services rendered, and are usually assigned using allocation formulas. In a plant that manufactures multiple products, examples of indirect costs include the plant supervisor's salary and the cost of machines used to produce more than one type of product.

Diff: 2
Terms: direct costs, indirect costs
Objective: 2
AACSB: Reflective thinking
Objective 2.3

1) A mixed cost is:
A) a fixed cost
B) a cost with fixed and variable elements
C) a variable cost
D) always an indirect cost
Answer: B
Diff: 2
Terms: mixed cost
Objective: 3
AACSB: Reflective thinking

2) Which of the following is a mixed cost?
A) monthly rent payment
B) manager's salary
C) monthly electric bill
D) direct materials
Answer: C
Diff: 2
Terms: mixed cost
Objective: 3
AACSB: Analytical skills

3) Cost behavior refers to:
A) how costs react to a change in the level of activity
B) whether a cost is incurred in a manufacturing, merchandising, or service company
C) classifying costs as either inventoriable or period costs
D) whether a particular expense has been ethically incurred
Answer: A
Diff: 2
Terms: fixed cost, variable cost
Objective: 3
AACSB: Reflective thinking

4) An understanding of the underlying behavior of costs helps in all of the following EXCEPT:
A) costs can be better estimated as volume expands and contracts
B) true costs can be better evaluated
C) process inefficiencies can be better identified and as a result improved
D) sales volume can be better estimated
Answer: D
Diff: 2
Terms: fixed cost, variable cost
Objective: 3
AACSB: Analytical skills
5) At a plant where a union agreement sets annual salaries and conditions, annual labor costs usually:
A) are considered a variable cost
B) are considered a fixed cost
C) depend on the scheduling of floor workers
D) depend on the scheduling of production runs
Answer: B
Diff: 2
Terms: fixed cost
Objective: 3
AACSB: Reflective thinking

6) Variable costs:
A) are always indirect costs
B) increase in total when the actual level of activity increases
C) include most personnel costs and depreciation on machinery
D) can always be traced directly to the cost object
Answer: B
Diff: 2
Terms: variable cost
Objective: 3
AACSB: Reflective thinking

7) Fixed costs:
A) may include either direct or indirect costs
B) vary with production or sales volumes
C) include parts and materials used to manufacture a product
D) can be adjusted in the short run to meet actual demands
Answer: A
Diff: 2
Terms: fixed cost
Objective: 3
AACSB: Reflective thinking

8) Fixed costs depend on the:
A) amount of resources used
B) amount of resources acquired
C) volume of production
D) volume of sales
Answer: B
Diff: 3
Terms: fixed cost
Objective: 3
AACSB: Reflective thinking
9) Which one of the following is a variable cost for an insurance company?
   A) rent
   B) president's salary
   C) sales commissions
   D) property taxes
   Answer:  C
   Diff:  1
   Terms:  variable cost
   Objective:  3
   AACSB:  Analytical skills

10) Which of the following is a fixed cost for an automobile manufacturing plant?
    A) administrative salaries
    B) electricity used by assembly-line machines
    C) sales commissions
    D) windows for each car produced
    Answer:  A
    Diff:  2
    Terms:  fixed cost
    Objective:  3
    AACSB:  Analytical skills

11) If each motorcycle requires a belt that costs $20 and 2,000 motorcycles are produced for the month, the total cost for belts is:
    A) considered to be a direct fixed cost
    B) considered to be a direct variable cost
    C) considered to be an indirect fixed cost
    D) considered to be an indirect variable cost
    Answer:  B
    Diff:  3
    Terms:  direct costs of a cost object, variable cost
    Objective:  3
    AACSB:  Analytical skills

12) The most likely cost driver of distribution costs is the:
    A) number of parts within the product
    B) number of miles driven
    C) number of products manufactured
    D) number of production hours
    Answer:  B
    Diff:  2
    Terms:  cost driver
    Objective:  3
    AACSB:  Analytical skills
13) The most likely cost driver of direct labor costs is the:
A) number of machine setups for the product
B) number of miles driven
C) number of production hours
D) number of machine hours
Answer: C
Diff: 2
Terms: cost driver
Objective: 3
AACSB: Analytical skills

14) Which of the following statements is FALSE?
A) There is a cause-and-effect relationship between the cost driver and the amount of cost.
B) Fixed costs have cost drivers over the short run.
C) Over the long run all costs have cost drivers.
D) Volume of production is a cost driver of direct manufacturing costs.
Answer: B
Diff: 2
Terms: cost driver
Objective: 3
AACSB: Reflective thinking

15) A band of normal activity or volume in which specific cost-volume relationships are maintained is referred to as the:
A) average range
B) cost-allocation range
C) cost driver range
D) relevant range
Answer: D
Diff: 1
Terms: relevant range
Objective: 3
AACSB: Reflective thinking

16) Within the relevant range, if there is a change in the level of the cost driver, then:
A) total fixed costs and total variable costs will change
B) total fixed costs and total variable costs will remain the same
C) total fixed costs will remain the same and total variable costs will change
D) total fixed costs will change and total variable costs will remain the same
Answer: C
Diff: 2
Terms: fixed cost, variable cost
Objective: 3
AACSB: Reflective thinking
17) Within the relevant range, if there is a change in the level of the cost driver, then:
A) fixed and variable costs per unit will change
B) fixed and variable costs per unit will remain the same
C) fixed costs per unit will remain the same and variable costs per unit will change
D) fixed costs per unit will change and variable costs per unit will remain the same
Answer: D
Diff: 2
Terms: relevant range
Objective: 3
AACSB: Reflective thinking

18) Which of the following would be LEAST likely to be a cost driver for a company's human resource costs?
A) the number of employees in the human resource department
B) the number of job applications processed
C) the number of units sold
D) the square footage of the office space used by the human resource department
Answer: C
Diff: 2
Terms: cost driver
Objective: 3
AACSB: Analytical skills

Answer the following questions using the information below:

The Singer Company manufactures several different products. Unit costs associated with Product ICT101 are as follows:

- Direct materials $ 60
- Direct manufacturing labor 10
- Variable manufacturing overhead 18
- Fixed manufacturing overhead 32
- Sales commissions (2% of sales) 4
- Administrative salaries 16
- **Total** $140

19) What are the variable costs per unit associated with Product ICT101?
A) $18
B) $22
C) $88
D) $92
Answer: D
Explanation: D) $60 + $10 + $18 + $4 = $92
Diff: 2
Terms: variable cost
Objective: 3
AACSB: Analytical skills
20) What are the fixed costs per unit associated with Product ICT101?
A) $102
B) $48
C) $52
D) $32
Answer: B
Explanation: B) $32 + 16 = $48
Diff: 2
Terms: fixed cost
Objective: 3
AACSB: Analytical skills

Answer the following questions using the information below:

The East Company manufactures several different products. Unit costs associated with Product ORD203 are as follows:

<table>
<thead>
<tr>
<th>Cost Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$50</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>8</td>
</tr>
<tr>
<td>Variable manufacturing overhead</td>
<td>10</td>
</tr>
<tr>
<td>Fixed manufacturing overhead</td>
<td>23</td>
</tr>
<tr>
<td>Sales commissions (2% of sales)</td>
<td>5</td>
</tr>
<tr>
<td>Administrative salaries</td>
<td>9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$105</strong></td>
</tr>
</tbody>
</table>

21) What are the variable costs per unit associated with Product ORD203?
A) $60
B) $82
C) $73
D) $105
Answer: C
Explanation: C) $50 + $8 + $10 + $5 = $73
Diff: 2
Terms: variable cost
Objective: 3
AACSB: Analytical skills

22) What are the fixed costs per unit associated with Product ORD203?
A) $23
B) $32
C) $35
D) $44
Answer: B
Explanation: B) $23 + 9 = $32
Diff: 2
Terms: fixed cost
Objective: 3
AACSB: Analytical skills
23) Fixed costs in total will NOT change in the short run, but may change in the long run.
Answer: TRUE
Diff: 2
Terms: fixed cost
Objective: 3
AACSB: Reflective thinking

24) Costs that are difficult to change over the short run are always variable over the long run.
Answer: TRUE
Diff: 2
Terms: variable cost
Objective: 3
AACSB: Analytical skills

25) A decision maker CANNOT adjust capacity over the short run.
Answer: TRUE
Diff: 1
Terms: fixed cost
Objective: 3
AACSB: Analytical skills

26) Variable costs per unit vary with the level of production or sales volume.
Answer: FALSE
Explanation: Variable costs per unit are constant with the level of production or sales volume.
Diff: 1
Terms: variable cost
Objective: 3
AACSB: Reflective thinking

27) Currently, most administrative personnel costs would be classified as fixed costs.
Answer: TRUE
Diff: 1
Terms: fixed cost
Objective: 3
AACSB: Reflective thinking

28) Fixed costs depend on the resources used, not the resources acquired.
Answer: FALSE
Explanation: Fixed costs depend on the resources acquired, and not whether the resources are used or not.
Diff: 2
Terms: fixed cost
Objective: 3
AACSB: Reflective thinking
29) The variable cost per unit of a product should stay the same throughout the relevant range of production.
Answer: TRUE
Diff: 2
Terms: variable cost, relevant range
Objective: 3
AACSB: Reflective thinking

30) An appropriate cost driver for shipping costs might be the number of units shipped.
Answer: TRUE
Diff: 2
Terms: cost driver
Objective: 3
AACSB: Analytical skills

31) Butler Hospital wants to estimate the cost for each patient stay. It is a general health care facility offering only basic services and not specialized services such as organ transplants.

**Required:**
a. Classify each of the following costs as either direct or indirect with respect to each patient.
b. Classify each of the following costs as either fixed or variable with respect to hospital costs per day.

<table>
<thead>
<tr>
<th></th>
<th>Direct</th>
<th>Indirect</th>
<th>Fixed</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic monitoring</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meals for patients</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurses' salaries</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parking maintenance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Answer:**

<table>
<thead>
<tr>
<th></th>
<th>Direct</th>
<th>Indirect</th>
<th>Fixed</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electronic monitoring</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Meals for patients</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nurses' salaries</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Parking maintenance</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Security</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Diff: 2
Terms: direct costs, indirect costs, fixed costs, variable costs
Objective: 2, 3
AACSB: Analytical skills
32) The list of representative cost drivers in the right column below are randomized with respect to the list of functions in the left column. That is, they do not match.

<table>
<thead>
<tr>
<th>Function</th>
<th>Representative Cost Driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Purchasing</td>
<td>A. Number of employees</td>
</tr>
<tr>
<td>2. Billing</td>
<td>B. Number of shipments</td>
</tr>
<tr>
<td>3. Shipping</td>
<td>C. Number of customers</td>
</tr>
<tr>
<td>4. Computer Support</td>
<td>D. Number of invoices</td>
</tr>
<tr>
<td>5. Personnel</td>
<td>E. Number of desktop computers</td>
</tr>
<tr>
<td>6. Customer Service</td>
<td>F. Number of purchase orders</td>
</tr>
</tbody>
</table>

**Required:**
Match each business function with its representative cost driver.

<table>
<thead>
<tr>
<th>Function</th>
<th>Insert letter of appropriate driver (A through F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Purchasing</td>
<td>F</td>
</tr>
<tr>
<td>2. Billing</td>
<td>D</td>
</tr>
<tr>
<td>3. Shipping</td>
<td>B</td>
</tr>
<tr>
<td>4. Computer Support</td>
<td>E</td>
</tr>
<tr>
<td>5. Personnel</td>
<td>A</td>
</tr>
<tr>
<td>6. Customer Service</td>
<td>C</td>
</tr>
</tbody>
</table>

Answer:

Diff: 2
Terms: cost driver
Objective: 3
AACSB: Analytical skills

33) Describe a variable cost. Describe a fixed cost. Explain why the distinction between variable and fixed costs is important in cost accounting.

Answer: *Total variable* costs increase with increased production or sales volumes. *Fixed costs* are not influenced by fluctuations in production or sales volumes. Without the knowledge of cost behaviors, budgets and other forecasting tools will be inaccurate and unreliable. Understanding whether a cost behaves as a variable or a fixed cost is essential to estimating and planning for business success.

Diff: 2
Terms: variable cost, fixed cost
Objective: 3
AACSB: Reflective thinking
Objective 2.4

1) A unit cost is computed by:
   A) multiplying total cost by the number of units
   B) dividing total cost by the number of units
   C) dividing variable cost by the number of units
   D) adding variable cost to fixed cost
   Answer:  B
   Diff: 2
   Terms:  unit cost
   Objective:  4
   AACSB:  Reflective thinking

2) In making product mix and pricing decisions, managers should focus on:
   A) total costs
   B) unit costs
   C) variable costs
   D) fixed costs
   Answer:  A
   Diff: 2
   Terms:  total cost
   Objective:  4
   AACSB:  Ethical reasoning

3) When 20,000 units are produced, fixed costs are $16 per unit. Therefore, when 40,000 units are produced fixed costs will:
   A) increase to $32 per unit
   B) remain at $16 per unit
   C) decrease to $8 per unit
   D) total $640,000
   Answer:  C
   Diff: 3
   Terms:  fixed cost
   Objective:  4
   AACSB:  Analytical skills

4) When 10,000 units are produced, variable costs are $6 per unit. Therefore, when 20,000 units are produced:
   A) variable costs will total $120,000
   B) variable costs will total $60,000
   C) variable unit costs will increase to $12 per unit
   D) variable unit costs will decrease to $3 per unit
   Answer:  A
   Diff: 3
   Terms:  variable cost
   Objective:  4
   AACSB:  Analytical skills
5) Amber Manufacturing provided the following information for last month:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$20,000</td>
</tr>
<tr>
<td>Variable costs</td>
<td>6,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>9,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$5,000</td>
</tr>
</tbody>
</table>

If sales double next month, what is the projected operating income?

- A) $10,000
- B) $25,000
- C) $19,000
- D) $12,000

Answer: C

Explanation: C) ($20,000 × 2) - ($6,000 × 2) - $9,000 = $19,000

Diff: 3

Terms: fixed cost, variable cost

Objective: 4

AACSB: Analytical skills

6) Kym Manufacturing provided the following information for last month:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$12,000</td>
</tr>
<tr>
<td>Variable costs</td>
<td>4,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>1,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$7,000</td>
</tr>
</tbody>
</table>

If sales double next month, what is the projected operating income?

- A) $14,000
- B) $15,000
- C) $18,000
- D) $19,000

Answer: B

Explanation: B) ($12,000 × 2) - ($4,000 × 2) - $1,000 = $15,000

Diff: 3

Terms: fixed cost, variable cost

Objective: 4

AACSB: Analytical skills
7) Wheel and Tire Manufacturing currently produces 1,000 tires per month. The following per unit data apply for sales to regular customers:

- Direct materials $20
- Direct manufacturing labor 3
- Variable manufacturing overhead 6
- Fixed manufacturing overhead 10
- Total manufacturing costs $39

The plant has capacity for 3,000 tires and is considering expanding production to 2,000 tires. What is the total cost of producing 2,000 tires?
A) $39,000
B) $78,000
C) $68,000
D) $62,000
Answer: C
Explanation: C) [($20 + $3 + $6) × 2,000 units] + ($10 × 1,000 units) = $68,000
Diff: 2
Terms: fixed cost, variable cost
Objective: 4
AACSB: Analytical skills

8) XIAN Manufacturing produces a unique valve, and has the capacity to produce 50,000 valves annually. Currently XIAN produces 40,000 valves and is thinking about increasing production to 45,000 valves next year. What is the most likely behavior of total manufacturing costs and unit manufacturing costs given this change?
A) Total manufacturing costs will increase and unit manufacturing costs will stay the same.
B) Total manufacturing costs will increase and unit manufacturing costs will decrease.
C) Total manufacturing costs will stay the same and unit manufacturing costs will stay the same.
D) Total manufacturing costs will stay the same and unit manufacturing costs will decrease.
Answer: B
Diff: 3
Terms: fixed cost, variable cost
Objective: 4
AACSB: Analytical skills
9) Tire and Spoke Manufacturing currently produces 1,000 bicycles per month. The following per unit data apply for sales to regular customers:

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$50</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>5</td>
</tr>
<tr>
<td>Variable manufacturing overhead</td>
<td>14</td>
</tr>
<tr>
<td>Fixed manufacturing overhead</td>
<td>10</td>
</tr>
<tr>
<td><strong>Total manufacturing costs</strong></td>
<td><strong>$79</strong></td>
</tr>
</tbody>
</table>

The plant has capacity for 3,000 bicycles and is considering expanding production to 2,000 bicycles. What is the per unit cost of producing 2,000 bicycles?

A) $79 per unit  
B) $158 per unit  
C) $74 per unit  
D) $134 per unit

Answer: C

Explanation: 
C) \[\left(50 + 5 + 14\right) \times 2,000 \text{ units} + 10 \times 1,000 \text{ units} = 148,000 \text{ / } 2,000 \text{ units} = 74\]

Diff: 3  
Terms: unit cost  
Objective: 4  
AACSB: Analytical skills

Answer the following questions using the information below:

Axle and Wheel Manufacturing currently produces 1,000 axles per month. The following per unit data apply for sales to regular customers:

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$30</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>5</td>
</tr>
<tr>
<td>Variable manufacturing overhead</td>
<td>10</td>
</tr>
<tr>
<td>Fixed manufacturing overhead</td>
<td>40</td>
</tr>
<tr>
<td><strong>Total manufacturing costs</strong></td>
<td><strong>$85</strong></td>
</tr>
</tbody>
</table>

10) The plant has capacity for 3,000 axles and is considering expanding production to 3,000 axles. What is the total cost of producing 3,000 axles?

A) $135,000  
B) $225,000  
C) $175,000  
D) $255,000

Answer: C

Explanation: 
C) \[\left(30 + 5 + 10\right) \times 3,000 \text{ units} + 40 \times 1,000 \text{ units} = 175,000\]

Diff: 2  
Terms: fixed cost, variable cost  
Objective: 4  
AACSB: Analytical skills
11) What is the per unit cost when producing 3,000 axles?
A) $58.33
B) $175.00
C) $85.00
D) $125.00
Answer: A
Explanation: A) $175,000 / 3,000 = $58.33
Diff: 2
Terms: unit cost
Objective: 4
AACSB: Analytical skills

Answer the following questions using the information below:

Pederson Company reported the following:

Manufacturing costs $2,000,000
Units manufactured 50,000
Units sold 47,000 units sold for $75 per unit
Beginning inventory 0 units

12) What is the average manufacturing cost per unit?
A) $40.00
B) $42.55
C) $0.025
D) $75.00
Answer: A
Explanation: A) $2,000,000 / 50,000 = $40.00
Diff: 1
Terms: average cost, unit cost
Objective: 4
AACSB: Analytical skills

13) What is the amount of ending finished goods inventory?
A) $1,880,000
B) $120,000
C) $225,000
D) $105,000
Answer: B
Explanation: B) (50,000 - 47,000) × ($2,000,000 / $50,000) = $120,000
Diff: 2
Terms: finished-goods inventory
Objective: 4
AACSB: Analytical skills
Answer the following questions using the information below:

The following information pertains to Alleigh's Mannequins:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Units manufactured</td>
<td>30,000</td>
</tr>
<tr>
<td>Units sold</td>
<td>29,500 units sold for $85 per unit</td>
</tr>
<tr>
<td>Beginning inventory</td>
<td>0 units</td>
</tr>
</tbody>
</table>

14) What is the average manufacturing cost per unit?
A) $50.00
B) $50.85
C) $17.65
D) $85.00
Answer:  A
Explanation:  A) $1,500,000 / 30,000 = $50.00
Diff: 1
Terms:  unit cost
Objective:  4
AACSB:  Analytical skills

15) What is the amount of ending finished goods inventory?
A) $42,500
B) $25,424
C) $25,000
D) $1,475,000
Answer:  C
Explanation:  C) (30,000 - 29,500) × ($1,500,000 / $30,000) = $25,000
Diff: 2
Terms:  finished-goods inventory
Objective:  4
AACSB:  Analytical skills

16) When making decisions using fixed costs, the focus should be on total costs and not unit costs.
Answer:  TRUE
Diff: 2
Terms:  fixed cost
Objective:  4
AACSB:  Reflective thinking

17) When 100,000 units are produced the fixed cost is $20 per unit. Therefore, when 500,000 units are produced fixed costs will remain at $20 per unit.
Answer:  FALSE
Explanation:  When 500,000 units are produced fixed costs will decrease to $4 per unit.
Diff: 3
Terms:  fixed cost, unit cost
Objective:  4
AACSB:  Analytical skills
18) A unit cost is computed by dividing total cost by the number of units.
Answer: TRUE
Diff: 1
Terms: unit cost
Objective: 4
AACSB: Reflective thinking

19) Unit costs and average costs are really the same thing.
Answer: TRUE
Diff: 2
Terms: average cost, unit cost
Objective: 4
AACSB: Reflective thinking

20) Mirabella, Inc., reports the following information for September sales:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$60,000</td>
</tr>
<tr>
<td>Variable costs</td>
<td>12,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>16,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$32,000</td>
</tr>
</tbody>
</table>

Required:
If sales double in October, what is the projected operating income?
Answer: $(60,000 \times 2) - (12,000 \times 2) - 16,000 = 80,000$
Diff: 2
Terms: fixed cost, variable cost
Objective: 4
AACSB: Analytical skills
21) Axle and Wheel Manufacturing currently produces 1,000 axles per month. The following per unit data apply for sales to regular customers:

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$200</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>30</td>
</tr>
<tr>
<td>Variable manufacturing overhead</td>
<td>60</td>
</tr>
<tr>
<td>Fixed manufacturing overhead</td>
<td>40</td>
</tr>
<tr>
<td>Total manufacturing costs</td>
<td>$330</td>
</tr>
</tbody>
</table>

The plant has capacity for 2,000 axles.

**Required:**

a. What is the total cost of producing 1,000 axles?
b. What is the total cost of producing 1,500 axles?
c. What is the per unit cost when producing 1,500 axles?

**Answer:**

a. 
\[ ($200 + 30 + 60) \times 1,000 \text{ units} + (40 \times 1,000 \text{ units}) = 330,000 \]
b. 
\[ ($200 + 30 + 60) \times 1,500 \text{ units} + 40,000 = 475,000 \]
c. 
\[ 475,000 / 1,500 = 316.67 \text{ per unit} \]

**Diff:** 2  
**Terms:** fixed cost, variable cost, unit cost  
**Objective:** 4  
**AACSB:** Analytical skills

22) During 2011, Favata Corporation incurred manufacturing expenses of $20,000,000 to produce 400,000 finished units. At year-end, it was determined that 370,000 units were sold while 30,000 units remained in ending inventory.

**Required:**

a. What is the cost of producing one unit?
b. What is the amount that will be reported on the income statement for cost of goods sold?
c. What is the amount that will be reported on the balance sheet for ending inventory?

**Answer:**

a. 
\[ 20,000,000 / 400,000 = 50.00 \]
b. 
\[ 370,000 \text{ units} \times 50 = 18,500,000 \]
c. 
\[ 30,000 \text{ units} \times 50 = 1,500,000 \]

**Diff:** 2  
**Terms:** unit cost, finished goods  
**Objective:** 4  
**AACSB:** Analytical skills
Objective 2.5

Answer the following questions using the information below:

Pederson Company reported the following:

Manufacturing costs $2,000,000
Units manufactured 50,000
Units sold 47,000 units sold for $75 per unit
Beginning inventory 0 units

1) What is the amount of gross margin?
A) $1,750,000
B) $3,525,000
C) $5,405,000
D) $1,645,000
Answer: D
Explanation: D) $75 - ($2,000,000 / $50,000) = $1,645,000
Diff: 3
Terms: manufacturing-sector companies
Objective: 5
AACSB: Analytical skills

2) ________ - sector companies purchase materials and components and convert them into finished goods.
A) Merchandising
B) Service
C) Manufacturing
D) Professional
Answer: C
Diff: 2
Terms: manufacturing-sector company
Objective: 5
AACSB: Analytical skills

3) ________ - sector companies purchase and then sell tangible products without changing their basic form.
A) Merchandising
B) Professional
C) Service
D) Manufacturing
Answer: A
Diff: 2
Terms: merchandising-sector companies
Objective: 5
AACSB: Analytical skills
4) _______ - sector companies provide intangible products.
A) Professional  
B) Manufacturing  
C) Merchandising  
D) Service  
Answer: D  
Diff: 2  
Terms: service-sector companies  
Objective: 5  
AACSB: Analytical skills  

Answer the following questions using the information below:

The following information pertains to Alleigh's Mannequins:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing costs</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Units manufactured</td>
<td>30,000</td>
</tr>
<tr>
<td>Units sold</td>
<td>29,500</td>
</tr>
<tr>
<td>Beginning inventory</td>
<td>0 units</td>
</tr>
<tr>
<td>Units sold for $85 per unit</td>
<td>29,500</td>
</tr>
</tbody>
</table>

5) What is the amount of gross margin?
A) $1,475,000  
B) $1,500,000  
C) $2,507,500  
D) $1,032,500  
Answer: D  
Explanation: D) $29,500 × ($85 - ($1,500,000 / $30,000)) = $1,032,500  
Diff: 3  
Terms: manufacturing-sector company  
Objective: 5  
AACSB: Analytical skills  

6) Which of the following companies is part of the service sector of our economy?
A) Target  
B) Citibank  
C) Ford  
D) Amazon.com  
Answer: B  
Diff: 1  
Terms: service-sector companies  
Objective: 5  
AACSB: Analytical skills
7) Which of the following companies is part of the merchandising sector of our economy?
A) Ford
B) Hewlett Packard
C) Macy's
D) Michael Toback Accounting Firm
Answer: C
Diff: 1
Terms: merchandising-sector companies
Objective: 5
AACSB: Analytical skills

8) Which of the following companies is part of the manufacturing sector of our economy?
A) Nike
B) Barnes & Noble
C) Corvette Law Firm
D) Sears, Roebuck, and Company
Answer: A
Diff: 1
Terms: manufacturing-sector companies
Objective: 5
AACSB: Analytical skills

9) Yahoo, an Internet search firm, would be classified as:
A) a manufacturing-sector company
B) a merchandising-sector company
C) a service sector company
D) None of these answers are correct.
Answer: C
Diff: 2
Terms: service-sector companies
Objective: 5
AACSB: Use of Information Technology

10) Service-sector companies report:
A) only merchandise inventory
B) only finished goods inventory
C) direct materials inventory, work-in-process inventory, and finished goods inventory accounts
D) no inventory accounts
Answer: D
Diff: 1
Terms: service-sector companies
Objective: 5
AACSB: Reflective thinking
11) Manufacturing-sector companies report:
A) only merchandise inventory  
B) only finished goods inventory  
C) direct materials inventory, work-in-process inventory, and finished goods inventory accounts  
D) no inventory accounts  
Answer: C  
Diff: 1  
Terms: manufacturing-sector companies  
Objective: 5  
AACSB: Reflective thinking

12) For a manufacturing company, direct material costs may be included in:
A) direct materials inventory only  
B) merchandise inventory only  
C) both work-in-process inventory and finished goods inventory  
D) direct materials inventory, work-in-process inventory, and finished goods inventory accounts  
Answer: D  
Diff: 3  
Terms: manufacturing-sector companies, direct material costs  
Objective: 5  
AACSB: Reflective thinking

13) For a manufacturing company, direct labor costs may be included in:
A) direct materials inventory only  
B) merchandise inventory only  
C) both work-in-process inventory and finished goods inventory  
D) direct materials inventory, work-in-process inventory, and finished goods inventory accounts  
Answer: C  
Diff: 3  
Terms: manufacturing sector companies, direct manufacturing labor costs  
Objective: 5  
AACSB: Reflective thinking

14) For a manufacturing company, indirect manufacturing costs may be included in:
A) direct materials inventory only  
B) merchandise inventory only  
C) both work-in-process inventory and finished goods inventory  
D) direct materials inventory, work-in-process inventory, and finished goods inventory accounts  
Answer: C  
Diff: 3  
Terms: indirect manufacturing costs  
Objective: 5  
AACSB: Reflective thinking
15) For a manufacturing-sector company, the cost of factory depreciation is classified as a:
A) direct material cost
B) direct manufacturing labor cost
C) manufacturing overhead cost
D) period cost
Answer: C
Diff: 1
Terms: period costs
Objective: 5
AACSB: Reflective thinking

16) For a printing company, the cost of paper is classified as a:
A) direct material cost
B) direct manufacturing labor cost
C) manufacturing overhead cost
D) period cost
Answer: A
Diff: 1
Terms: direct material costs
Objective: 5
AACSB: Reflective thinking

17) Manufacturing overhead costs in an automobile manufacturing plant most likely include:
A) labor costs of the painting department
B) indirect material costs such as lubricants
C) sales commissions
D) steering wheel costs
Answer: B
Diff: 1
Terms: manufacturing overhead costs
Objective: 5
AACSB: Reflective thinking

18) Manufacturing overhead costs are also referred to as:
A) indirect manufacturing costs
B) prime costs
C) period costs
D) direct material
Answer: A
Diff: 1
Terms: manufacturing overhead costs
Objective: 5
AACSB: Reflective thinking
19) Merchandising companies normally report:
   A) only merchandise inventory
   B) only finished goods inventory
   C) direct materials inventory, work-in-process inventory, and finished goods inventory accounts
   D) no inventory accounts
Answer: A
Diff: 1
Terms: merchandising-sector companies
Objective: 5
AACSB: Reflective thinking

20) Direct materials inventory would normally include:
   A) direct materials in stock and awaiting use in the manufacturing process
   B) goods partially worked on but not yet fully completed
   C) goods fully completed but not yet sold
   D) products in their original form intended to be sold without changing their basic form
Answer: A
Diff: 1
Terms: direct materials inventory
Objective: 5
AACSB: Reflective thinking

21) Work-in-process inventory would normally include:
   A) direct materials in stock and awaiting use in the manufacturing process
   B) goods partially worked on but not yet fully completed
   C) goods fully completed but not yet sold
   D) products in their original form intended to be sold without changing their basic form
Answer: B
Diff: 1
Terms: work-in-process inventory
Objective: 5
AACSB: Reflective thinking

22) Finished goods inventory would normally include:
   A) direct materials in stock and awaiting use in the manufacturing process
   B) goods partially worked on but not yet fully completed
   C) goods fully completed but not yet sold
   D) products in their original form intended to be sold without changing their basic form
Answer: C
Diff: 1
Terms: finished-goods inventory
Objective: 5
AACSB: Reflective thinking
23) Finished goods inventory would normally include:
A) direct materials in stock and awaiting use in the manufacturing process
B) goods partially worked on but not yet fully completed
C) goods fully completed but not yet sold
D) products in their original form intended to be sold without changing their basic form
Answer: C

Diff: 1
Terms: manufacturing-sector companies
Objective: 5
AACSB: Reflective thinking

24) ______ are the acquisition costs of all materials that eventually become part of the cost object and can be traced to the cost object.
A) Direct manufacturing labor costs
B) Direct material costs
C) Indirect manufacturing costs
D) Manufacturing overhead costs
Answer: B
Diff: 2
Terms: direct material costs
Objective: 5
AACSB: Reflective thinking

25) ______ include the compensation of all manufacturing labor that can be traced to the cost object.
A) Direct manufacturing labor costs
B) Indirect manufacturing costs
C) Direct material costs
D) Manufacturing overhead costs
Answer: A
Diff: 2
Terms: direct manufacturing labor costs
Objective: 5
AACSB: Reflective thinking

26) ______ are all manufacturing costs that are related to the cost object but CANNOT be traced to that cost object.
A) Direct material costs
B) Period costs
C) Indirect manufacturing costs
D) Direct manufacturing labor costs
Answer: C
Diff: 2
Terms: indirect manufacturing costs
Objective: 5
AACSB: Reflective thinking
27) The income statement of a manufacturing firm reports:
A) period costs only
B) inventoriable costs only
C) both period and inventoriable costs
D) period and inventoriable costs but at different times; the reporting varies
Answer: C
Diff: 2
Terms: period costs, inventoriable costs
Objective: 5
AACSB: Reflective thinking

28) The income statement of a service-sector firm reports:
A) period costs only
B) inventoriable costs only
C) both period and inventoriable costs
D) period and inventoriable costs but at different times; the reporting varies
Answer: A
Diff: 2
Terms: service-sector companies, period costs
Objective: 5
AACSB: Reflective thinking

29) Manufacturing costs include all of the following EXCEPT:
A) costs incurred inside the factory
B) both direct and indirect costs
C) both variable and fixed costs
D) both direct and period costs
Answer: D
Diff: 2
Terms: manufacturing-sector companies
Objective: 5
AACSB: Reflective thinking

30) Inventoriable costs:
A) include administrative and marketing costs
B) are expensed in the accounting period in which the products are sold
C) are particularly useful in management accounting
D) are also referred to as nonmanufacturing costs
Answer: B
Diff: 2
Terms: inventoriable costs
Objective: 5
AACSB: Reflective thinking
31) Inventoriable costs are expensed on the income statement:
A) when direct materials for the product are purchased  
B) after the products are manufactured  
C) when the products are sold  
D) not at any particular time, it varies  
Answer:  C  
Diff: 2  
Terms:  inventoriable costs  
Objective:  5  
AACSB:  Reflective thinking  

32) Costs that are initially recorded as assets and expensed when sold are called:
A) period costs  
B) inventoriable costs  
C) variable costs  
D) fixed costs  
Answer:  B  
Diff: 2  
Terms:  inventoriable costs  
Objective:  5  
AACSB:  Reflective thinking  

33) For merchandising companies, inventoriable costs include all of the following EXCEPT:
A) the cost of the goods themselves  
B) incoming freight costs  
C) insurance costs for the goods  
D) outgoing freight costs  
Answer:  D  
Diff: 2  
Terms:  inventoriable costs, merchandising-sector companies  
Objective:  5  
AACSB:  Reflective thinking  

34) For manufacturing firms, inventoriable costs include:
A) plant supervisor salaries  
B) research and development costs  
C) costs of dealing with customers after the sale  
D) distribution costs  
Answer:  A  
Diff: 2  
Terms:  inventoriable costs, manufacturing-sector companies  
Objective:  5  
AACSB:  Reflective thinking
35) A plant manufactures several different products. The wages of the plant supervisor can be classified as a(n):
A) direct cost
B) inventoriable cost
C) variable cost
D) period cost
Answer: B
Diff: 2
Terms: inventoriable costs
Objective: 5
AACSB: Reflective thinking

36) The cost of inventory reported on the balance sheet may include all of the following EXCEPT:
A) customer-service costs
B) wages of the plant supervisor
C) depreciation of the factory equipment
D) the cost of parts used in the manufacturing process
Answer: A
Diff: 2
Terms: inventoriable costs, period costs
Objective: 5
AACSB: Reflective thinking

37) For a automobile manufacturer, period costs include the cost of:
A) the dashboard
B) labor used for assembly
C) advertising
D) assembly-line equipment
Answer: C
Diff: 1
Terms: period costs, manufacturing-sector company
Objective: 5
AACSB: Use of Information Technology

38) Period costs:
A) include only fixed costs
B) seldom influence financial success or failure
C) include the cost of selling, delivering, and after-sales support for customers
D) should be treated as an indirect cost rather than as a direct manufacturing cost
Answer: C
Diff: 2
Terms: period costs
Objective: 5
AACSB: Reflective thinking
39) Period costs:
A) are treated as expenses in the period they are incurred
B) are directly traceable to products
C) include direct labor
D) are also referred to as manufacturing overhead costs
Answer: A
Diff: 2
Terms: period costs
Objective: 5
AACSB: Reflective thinking

40) Which of the following is NOT a period cost?
A) marketing costs
B) general and administrative costs
C) research and development costs
D) direct materials
Answer: D
Diff: 1
Terms: period costs
Objective: 5
AACSB: Analytical skills

41) Costs expensed on the income statement in the accounting period incurred are called:
A) direct costs
B) indirect costs
C) period costs
D) inventoriable costs
Answer: C
Diff: 1
Terms: period costs
Objective: 5
AACSB: Reflective thinking

42) Prime costs include:
A) direct materials and direct manufacturing labor costs
B) direct manufacturing labor and manufacturing overhead costs
C) direct materials and manufacturing overhead costs
D) only direct materials
Answer: A
Diff: 1
Terms: prime costs
Objective: 5
AACSB: Reflective thinking
43) Conversion costs include:
A) direct materials and direct manufacturing labor costs
B) direct manufacturing labor and manufacturing overhead costs
C) direct materials and manufacturing overhead costs
D) only direct materials
Answer: B
Diff: 1
Terms: conversion costs
Objective: 5
AACSB: Reflective thinking

44) Total manufacturing costs equal:
A) direct materials + prime costs
B) direct materials + conversion costs
C) direct manufacturing labor costs + prime costs
D) direct manufacturing labor costs + conversion costs
Answer: B
Diff: 2
Terms: prime costs, conversion costs
Objective: 5
AACSB: Reflective thinking

45) In the cost classification system used by manufacturing firms, assembly workers' wages would be included in all of the following EXCEPT:
A) product cost
B) prime cost
C) conversion cost
D) period cost
Answer: D
Diff: 2
Terms: prime costs, conversion costs
Objective: 5
AACSB: Analytical skills

46) In the cost classification system used by manufacturing firms, total manufacturing costs would include all of the following EXCEPT:
A) direct materials costs and conversion costs
B) direct materials costs, direct manufacturing labor costs, and manufacturing overhead costs
C) indirect materials costs, indirect manufacturing labor costs, and manufacturing overhead costs
D) prime costs and manufacturing overhead costs
Answer: C
Diff: 2
Terms: prime costs, conversion costs
Objective: 5
AACSB: Reflective thinking
47) Manufacturing overhead costs may include all of the following EXCEPT:
A) salary of the plant supervisor
B) labor that can be traced to individual products
C) material that can be traced to individual products
D) overtime premiums paid to plant workers
Answer: B
Diff: 3
Terms: manufacturing overhead costs
Objective: 5
AACSB: Reflective thinking

48) Which of the following formulas determine cost of goods sold in a merchandising entity?
A) Beginning inventory + Purchases + Ending inventory = Cost of goods sold
B) Beginning inventory + Purchases - Ending inventory = Cost of goods sold
C) Beginning inventory - Purchases + Ending inventory = Cost of goods sold
D) Beginning inventory - Ending inventory - Purchases = Cost of goods sold
Answer: B
Diff: 1
Terms: merchandising-sector companies
Objective: 5
AACSB: Reflective thinking

49) Which of the following formulas determine cost of goods sold in a manufacturing entity?
A) Beginning work-in-process inventory + Cost of goods manufactured - Ending work-in-process inventory = Cost of goods sold
B) Beginning work-in-process inventory + Cost of goods manufactured + Ending work-in-process inventory = Cost of goods sold
C) Cost of goods manufactured - Beginning finished goods inventory - Ending finished goods inventory = Cost of goods sold
D) Cost of goods manufactured + Beginning finished goods inventory - Ending finished goods inventory = Cost of goods sold
Answer: D
Diff: 2
Terms: manufacturing-sector companies
Objective: 5
AACSB: Reflective thinking

50) Product cost for reimbursement under government contracts may include all costs EXCEPT:
A) marketing costs
B) design costs
C) production costs
D) research and development costs
Answer: A
Diff: 2
Terms: contracting with government agencies
Objective: 5
AACSB: Reflective thinking
51) The following information pertains to the Cannady Corporation:

- Beginning work-in-process inventory $ 50,000
- Ending work-in-process inventory 48,000
- Beginning finished goods inventory 180,000
- Ending finished goods inventory 195,000
- Cost of goods manufactured 1,220,000

What is cost of goods sold?
A) $1,235,000
B) $1,205,000
C) $1,218,000
D) $1,222,000
Answer: B
Explanation: B) $180,000 + $1,220,000 - $195,000 = $1,205,000
Diff: 3
Terms: cost of goods manufactured
Objective: 5
AACSB: Analytical skills

52) The following information pertains to the Duggan Corporation:

- Beginning work-in-process inventory $ 20,000
- Ending work-in-process inventory 23,000
- Beginning finished goods inventory 36,000
- Ending finished goods inventory 34,000
- Cost of goods manufactured 246,000

What is cost of goods sold?
A) $244,000
B) $248,000
C) $243,000
D) $249,000
Answer: B
Explanation: B) $36,000 + $246,000 - $34,000 = $248,000
Diff: 2
Terms: cost of goods manufactured
Objective: 5
AACSB: Analytical skills
Answer the following questions using the information below:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning finished goods, 1/1/20X3</td>
<td>$90,000</td>
</tr>
<tr>
<td>Ending finished goods, 12/31/20X3</td>
<td>$77,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>$270,000</td>
</tr>
<tr>
<td>Sales revenue</td>
<td>$500,000</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>$155,000</td>
</tr>
</tbody>
</table>

53) What is cost of goods manufactured for 20X3?
A) $230,000  
B) $257,000  
C) $283,000  
D) $355,000  

Answer: B  
Explanation: B) $270,000 + $77,000 - $90,000 = $257,000  
Diff: 2  
Terms: cost of goods manufactured  
Objective: 5  
AACSB: Analytical skills

54) What is gross margin for 20X3?
A) $283,000  
B) $355,000  
C) $230,000  
D) $257,000  

Answer: C  
Explanation: C) $500,000 - $270,000 = $230,000  
Diff: 2  
Terms: revenues, period costs  
Objective: 5  
AACSB: Analytical skills

55) What is operating income for 20X3?
A) $75,000  
B) $112,000  
C) $62,000  
D) $230,000  

Answer: A  
Explanation: A) $500,000 - $270,000 - $155,000 = $75,000  
Diff: 2  
Terms: revenues, period costs  
Objective: 5  
AACSB: Analytical skills
Answer the following questions using the information below:

- Beginning finished goods, 1/1/20X5: $40,000
- Ending finished goods, 12/31/20X5: $33,000
- Cost of goods sold: $250,000
- Sales revenue: $600,000
- Operating expenses: $120,000

56) What is cost of goods manufactured for 20X5?
A) $257,000  
B) $350,000  
C) $243,000  
D) $250,000  
Answer: C  
Explanation: C) $250,000 + $33,000 - $40,000 = $243,000  
Diff: 2  
Terms: cost of goods manufactured  
Objective: 5  
AACSB: Analytical skills

57) What is gross margin for 20X5?
A) $243,000  
B) $527,000  
C) $357,000  
D) $350,000  
Answer: D  
Explanation: D) $600,000 - $250,000 = $350,000  
Diff: 2  
Terms: revenues  
Objective: 5  
AACSB: Analytical skills

58) What is operating income for 20X5?
A) $230,000  
B) $123,000  
C) $107,000  
D) $157,000  
Answer: A  
Explanation: A) $600,000 - $250,000 - $120,000 = $230,000  
Diff: 2  
Terms: revenues, period costs  
Objective: 5  
AACSB: Analytical skills
The Singer Company manufactures several different products. Unit costs associated with Product ICT101 are as follows:

- Direct materials $60
- Direct manufacturing labor 10
- Variable manufacturing overhead 18
- Fixed manufacturing overhead 32
- Sales commissions (2% of sales) 4
- Administrative salaries 16
- Total $140

59) What are the inventoriable costs per unit associated with Product ICT101?
   A) $120
   B) $140
   C) $50
   D) $88
   Answer: A
   Explanation: A) $60 + $10 + $18 + $32 = $120
   Diff: 2
   Terms: inventoriable costs
   Objective: 5
   AACSB: Analytical skills

60) What are the period costs per unit associated with Product ICT101?
   A) $4
   B) $16
   C) $20
   D) $52
   Answer: C
   Explanation: C) $4 + 16 = $20
   Diff: 2
   Terms: period costs
   Objective: 5
   AACSB: Analytical skills
The East Company manufactures several different products. Unit costs associated with Product ORD203 are as follows:

- Direct materials $50
- Direct manufacturing labor 8
- Variable manufacturing overhead 10
- Fixed manufacturing overhead 23
- Sales commissions (2% of sales) 5
- Administrative salaries 9

**Total** $105

61) What are the inventoriable costs per unit associated with Product ORD203?
A) $60  
B) $66  
C) $48  
D) $91  
Answer: D  
Explanation: D) $50 + $8 + $10 + $23 = $91  
Diff: 2  
Terms: inventoriable costs  
Objective: 5  
AACSB: Analytical skills

62) What are the period costs per unit associated with Product ORD203?
A) $14  
B) $5  
C) $9  
D) $26  
Answer: A  
Explanation: A) $5 + 9 = $14  
Diff: 2  
Terms: period costs  
Objective: 5  
AACSB: Analytical skills

63) For last year, Wampum Enterprises reported revenues of $420,000, cost of goods sold of $108,000, cost of goods manufactured of $101,000, and total operating costs of $70,000. Operating income for that year was:
A) $319,000  
B) $312,000  
C) $249,000  
D) $242,000  
Answer: D  
Explanation: D) $420,000 - $108,000 - $70,000 = $242,000  
Diff: 2  
Terms: revenues, cost of goods manufactured, period costs  
Objective: 5  
AACSB: Analytical skills
64) For last year, Wampum Enterprises reported revenues of $420,000, cost of goods sold of $108,000, cost of goods manufactured of $101,000, and total operating costs of $70,000. Gross margin for last year was:
A) $319,000  
B) $312,000  
C) $249,000  
D) $242,000  
Answer:  B  
Explanation:  B) $420,000 - $108,000 = $312,000  
Diff: 2  
Terms:  revenues, cost of goods manufactured, period costs  
Objective:  5  
AACSB:  Analytical skills  

Answer the following questions using the information below:

For last year, Lewisburn Manufacturing reported the following:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>$420,000</td>
</tr>
<tr>
<td>Beginning inventory of direct materials, January 1</td>
<td>22,000</td>
</tr>
<tr>
<td>Purchases of direct materials</td>
<td>146,000</td>
</tr>
<tr>
<td>Ending inventory of direct materials, December 31</td>
<td>16,000</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>18,000</td>
</tr>
<tr>
<td>Indirect manufacturing costs</td>
<td>40,000</td>
</tr>
<tr>
<td>Beginning inventory of finished goods, January 1</td>
<td>35,000</td>
</tr>
<tr>
<td>Cost of goods manufactured</td>
<td>104,000</td>
</tr>
<tr>
<td>Ending inventory of finished goods, December 31</td>
<td>36,000</td>
</tr>
<tr>
<td>Operating costs</td>
<td>140,000</td>
</tr>
</tbody>
</table>

65) What was Lewisburn's cost of goods sold?  
A) $103,000  
B) $152,000  
C) $268,000  
D) $317,000  
Answer:  A  
Explanation:  A) $35,000 + $104,000 - $36,000 = $103,000  
Diff: 3  
Terms:  revenues, cost of goods manufactured  
Objective:  5  
AACSB:  Analytical skills
66) What was Lewisburn's gross margin (or gross profit)?
   A) $103,000
   B) $152,000
   C) $268,000
   D) $317,000
   Answer: D
   Explanation: D) $420,000 - ($35,000 + $104,000 - $36,000) = $317,000
   Diff: 3
   Terms: revenues, cost of goods manufactured
   Objective: 5
   AACSB: Analytical skills

67) What was Lewisburn's operating income?
   A) $76,000
   B) $128,000
   C) $177,000
   D) $280,000
   Answer: C
   Explanation: C) $420,000 - ($35,000 + $104,000 - $36,000) - $140,000 = $177,000
   Diff: 3
   Terms: revenues, cost of goods manufactured
   Objective: 5
   AACSB: Analytical skills

68) How much of the above would be considered period costs for Lewisburn Manufacturing?
   A) $104,000
   B) $140,000
   C) $246,000
   D) $390,000
   Answer: B
   Explanation: B) $140,000
   Diff: 3
   Terms: period costs
   Objective: 5
   AACSB: Analytical skills

69) Service-sector companies provide services or intangible products to their customers.
   Answer: TRUE
   Diff: 1
   Terms: service-sector companies
   Objective: 5
   AACSB: Reflective thinking

70) Google would be an example of a merchandising company.
   Answer: FALSE
   Explanation: Google would be an example of a service-sector company.
   Diff: 2
   Terms: service-sector companies, merchandising-sector companies
   Objective: 5
   AACSB: Use of Information Technology
71) Merchandising companies purchase products and sell them to customers without changing their basic form.
Answer: TRUE
Diff: 2
Terms: merchandising-sector companies
Objective: 5
AACSB: Reflective thinking

72) Merchandising companies hold only one type of inventory: direct material.
Answer: FALSE
Explanation: Merchandising companies normally hold only one type of inventory: merchandise inventory.
Diff: 2
Terms: merchandising-sector companies
Objective: 5
AACSB: Reflective thinking

73) Manufacturing sector firms normally hold three types of inventory: direct materials inventory, work-in-process inventory, and finished goods inventory.
Answer: TRUE
Diff: 2
Terms: merchandising-sector companies
Objective: 5
AACSB: Reflective thinking

74) Work-in-process inventory are goods partially worked on but not yet completed.
Answer: TRUE
Diff: 2
Terms: work-in-process inventory
Objective: 5
AACSB: Reflective thinking

75) Direct material costs are the acquisition costs of all materials that eventually become part of the cost object and CANNOT be traced to the cost object in an economically feasible way.
Answer: FALSE
Explanation: Direct material costs can be traced to the cost object.
Diff: 2
Terms: direct costs of a cost object
Objective: 5
AACSB: Reflective thinking

76) Acquisition costs of direct materials include freight-in charges, sales taxes, and custom duties.
Answer: TRUE
Diff: 2
Terms: direct material costs
Objective: 5
AACSB: Reflective thinking
77) Indirect manufacturing costs include the compensation of all manufacturing labor that can be traced to the cost object in an economically feasible way.
Answer: FALSE
Explanation: Direct manufacturing labor costs include the compensation of all manufacturing labor that can be traced to the cost object.
Diff: 2
Terms: indirect manufacturing costs
Objective: 5
AACSB: Reflective thinking

78) Direct manufacturing labor includes wages and fringe benefits paid to machine operators.
Answer: TRUE
Diff: 2
Terms: direct manufacturing labor costs
Objective: 5
AACSB: Reflective thinking

79) Inventoriable costs are reported as an expense when incurred and expensed on the income statement when the product is sold.
Answer: FALSE
Explanation: Inventoriable costs are reported as an asset when incurred and expensed on the income statement when the product is sold.
Diff: 2
Terms: inventoriable costs
Objective: 5
AACSB: Reflective thinking

80) Cost of goods sold refers to the products brought to completion, whether they were started before or during the current accounting period.
Answer: FALSE
Explanation: Cost of goods manufactured refers to the products brought to completion, whether they were started before or during the current accounting period.
Diff: 1
Terms: finished-goods inventory, cost of goods manufactured
Objective: 5
AACSB: Reflective thinking

81) Operating income is sales revenue minus operating expenses.
Answer: FALSE
Explanation: Operating income = sales revenue - cost of goods sold - operating expenses
Diff: 1
Terms: operating income
Objective: 5
AACSB: Reflective thinking

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82) All manufacturing costs are inventoriable costs.
Answer: TRUE
Diff: 2
Terms: inventoriable costs
Objective: 5
AACSB: Reflective thinking

83) All costs reported on the income statement of a service-sector company are period costs.
Answer: TRUE
Diff: 1
Terms: period costs
Objective: 5
AACSB: Reflective thinking

84) Period costs are never included as part of inventory.
Answer: TRUE
Diff: 1
Terms: period costs
Objective: 5
AACSB: Reflective thinking

85) Conversion costs include all direct manufacturing costs.
Answer: FALSE
Explanation: Prime costs include all direct manufacturing costs.
Diff: 1
Terms: conversion costs
Objective: 5
AACSB: Reflective thinking

86) Inventory of a manufacturing firm includes goods partially worked on but NOT yet fully completed.
Answer: TRUE
Diff: 1
Terms: work-in-process inventory
Objective: 5
AACSB: Reflective thinking

87) The wages of a plant supervisor would be classified as a period cost.
Answer: FALSE
Explanation: The wages of a plant supervisor would be classified as a product cost.
Diff: 2
Terms: period costs
Objective: 5
AACSB: Reflective thinking
88) For external reporting, GAAP requires that costs be classified as either variable or fixed.
   Answer: FALSE
   Explanation: For external reporting, GAAP requires that costs be classified as either product or period costs.
   Diff: 2
   Terms: fixed cost, variable cost
   Objective: 5
   AACSB: Reflective thinking

89) Depreciation can be classified as either an inventoriable cost or a period cost, depending on what is being depreciated.
   Answer: TRUE
   Diff: 2
   Terms: inventoriable costs, period costs
   Objective: 5
   AACSB: Reflective thinking

90) Depreciation on a factory can be classified as a period cost.
   Answer: FALSE
   Explanation: Depreciation on a factory is classified as a product cost.
   Diff: 2
   Terms: inventoriable costs, period costs
   Objective: 5
   AACSB: Reflective thinking
Springfield Manufacturing produces electronic storage devices, and uses the following three-part classification for its manufacturing costs: direct materials, direct manufacturing labor, and indirect manufacturing costs. Total indirect manufacturing costs for January were $300 million, and were allocated to each product on the basis of direct manufacturing labor costs of each line. Summary data (in millions) for January for the most popular electronic storage device, the Big Bertha, was:

<table>
<thead>
<tr>
<th></th>
<th><strong>Big Bertha</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct manufacturing costs</td>
<td>$4,500,000</td>
</tr>
<tr>
<td>Direct manufacturing labor costs</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Indirect manufacturing costs</td>
<td>$4,250,000</td>
</tr>
<tr>
<td>Units produced</td>
<td>40,000</td>
</tr>
</tbody>
</table>

**Required:**

a. Compute the manufacturing cost per unit for each product produced in January.

b. Suppose production will be reduced to 30,000 units in February. Speculate as to whether the unit costs in February will most likely be higher or lower than unit costs in January; it is not necessary to calculate the exact February unit cost. Briefly explain your reasoning.

Answer:

a. Unit costs for January were:

\[
\frac{($4,500,000 + $1,500,000 + $4,250,000)}{40,000} = 256.25 \text{ per unit}
\]

b. Unit costs should be higher in February if only 30,000 units are to be produced. Indirect manufacturing costs most likely include both fixed and variable components. Since fewer units are expected to be produced in February, total fixed costs will be spread over fewer units. This will result in an increase in total cost per unit since variable costs per unit will most likely not change with the decreased production.

Diff: 2
Terms: unit cost
Objective: 2, 4, 5
AACSB: Analytical skills
92) Whippany manufacturing wants to estimate costs for each product they produce at its Troy plant. The Troy plant produces three products at this plant, and runs two flexible assembly lines. Each assembly line can produce all three products.

Required:
a. Classify each of the following costs as either direct or indirect for each product.

b. Classify each of the following costs as either fixed or variable with respect to the number of units produced of each product.

<table>
<thead>
<tr>
<th>Cost Description</th>
<th>Direct</th>
<th>Indirect</th>
<th>Fixed</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly line labor wages</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Plant manager's wages</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Depreciation on the assembly line equipment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Component parts for the product</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Wages of security personnel for the factory</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Answer:

<table>
<thead>
<tr>
<th>Cost Description</th>
<th>Direct</th>
<th>Indirect</th>
<th>Fixed</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly line labor wages</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Plant manager's wages</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Depreciation on the assembly line equipment</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Component parts for the product</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Wages of security personnel for the factory</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Diff: 2
Terms: fixed cost, variable cost, direct cost, indirect cost
Objective: 2, 4, 5
AACSB: Analytical skills
93) Hammer Inc., had the following activities during 2012:

Direct materials:
- Beginning inventory: $20,000
- Purchases: 61,600
- Ending inventory: 10,400
- Direct manufacturing labor: 16,000
- Manufacturing overhead: 12,000
- Beginning work-in-process inventory: 800
- Ending work-in-process inventory: 4,000
- Beginning finished goods inventory: 24,000
- Ending finished goods inventory: 16,000

Required:

a. What is the cost of direct materials used during 2012?
b. What is cost of goods manufactured for 2012?
c. What is cost of goods sold for 2012?
d. What amount of prime costs was added to production during 2012?
e. What amount of conversion costs was added to production during 2012?

Answer:

a. $20,000 + $61,600 - $10,400 = $71,200
b. $71,200 + $16,000 + $12,000 + $800 - $4,000 = $96,000
c. $96,000 + $24,000 - $16,000 = $104,000
d. $71,200 + $16,000 = $87,200
e. $16,000 + $12,000 = $28,000

Diff: 2
Terms: direct cost, indirect cost, prime cost, conversion cost
Objective: 5
AACSB: Analytical skills
94) Helmer Sporting Goods Company manufactured 100,000 units in 20X5 and reported the following costs:

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandpaper</td>
<td>$32,000</td>
</tr>
<tr>
<td>Materials handling</td>
<td>320,000</td>
</tr>
<tr>
<td>Coolants &amp; lubricants</td>
<td>22,400</td>
</tr>
<tr>
<td>Indirect manufacturing labor</td>
<td>275,200</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>2,176,000</td>
</tr>
<tr>
<td>Direct materials, 1/1/X5</td>
<td>384,000</td>
</tr>
<tr>
<td>Finished goods, 1/1/X5</td>
<td>672,000</td>
</tr>
<tr>
<td>Finished goods, 12/31/X5</td>
<td>1,280,000</td>
</tr>
<tr>
<td>Work-in-process, 1/1/X5</td>
<td>96,000</td>
</tr>
<tr>
<td>Work-in-process, 12/31/X5</td>
<td>64,000</td>
</tr>
<tr>
<td>Leasing costs-plant</td>
<td>$384,000</td>
</tr>
<tr>
<td>Depreciation-equipment</td>
<td>224,000</td>
</tr>
<tr>
<td>Property taxes-equipment</td>
<td>32,000</td>
</tr>
<tr>
<td>Fire insurance-equipment</td>
<td>16,000</td>
</tr>
<tr>
<td>Direct material purchases</td>
<td>3,136,000</td>
</tr>
<tr>
<td>Direct materials, 12/31/X5</td>
<td>275,200</td>
</tr>
<tr>
<td>Sales revenue</td>
<td>12,800,000</td>
</tr>
<tr>
<td>Sales commissions</td>
<td>640,000</td>
</tr>
<tr>
<td>Sales salaries</td>
<td>576,000</td>
</tr>
<tr>
<td>Advertising costs</td>
<td>480,000</td>
</tr>
<tr>
<td>Administration costs</td>
<td>800,000</td>
</tr>
</tbody>
</table>

**Required:**

a. What is the amount of direct materials used during 20X5?
b. What manufacturing costs were added to WIP during 20X5?
c. What is cost of goods manufactured for 20X5?
d. What is cost of goods sold for 20X5?

**Answer:**

a. $384,000 + $3,136,000 - $275,200 = $3,244,800
b. $3,244,800 + $2,176,000 + $32,000 + $320,000 + $22,400 + $275,200 + $384,000 + $224,000 + $32,000 + $16,000 = $6,726,400
c. $6,726,400 + $96,000 - $64,000 = $6,758,400
d. $6,758,400 + $672,000 - $1,280,000 = $6,150,400

**Diff:** 3

**Terms:** cost of goods manufactured

**Objective:** 5

**AACSB:** Analytical skills
95) Messinger Manufacturing Company had the following account balances for the quarter ending March 31, unless otherwise noted:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work-in-process inventory (January 1)</td>
<td>$140,400</td>
</tr>
<tr>
<td>Work-in-process inventory (March 31)</td>
<td>$171,000</td>
</tr>
<tr>
<td>Finished goods inventory (January 1)</td>
<td>$540,000</td>
</tr>
<tr>
<td>Finished goods inventory (March 31)</td>
<td>$510,000</td>
</tr>
<tr>
<td>Direct materials used</td>
<td>$378,000</td>
</tr>
<tr>
<td>Indirect materials used</td>
<td>$84,000</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>$480,000</td>
</tr>
<tr>
<td>Indirect manufacturing labor</td>
<td>$186,000</td>
</tr>
<tr>
<td>Property taxes on manufacturing plant building</td>
<td>$28,800</td>
</tr>
<tr>
<td>Salespersons' company vehicle costs</td>
<td>$12,000</td>
</tr>
<tr>
<td>Depreciation of manufacturing equipment</td>
<td>$264,000</td>
</tr>
<tr>
<td>Depreciation of office equipment</td>
<td>$123,600</td>
</tr>
<tr>
<td>Miscellaneous plant overhead</td>
<td>$135,000</td>
</tr>
<tr>
<td>Plant utilities</td>
<td>$92,400</td>
</tr>
<tr>
<td>General office expenses</td>
<td>$305,400</td>
</tr>
<tr>
<td>Marketing distribution costs</td>
<td>$30,000</td>
</tr>
</tbody>
</table>

**Required:**

a. Prepare a cost of goods manufactured schedule for the quarter.

b. Prepare a cost of goods sold schedule for the quarter.

**Answer:**

a.

**Messinger Manufacturing Company**

**Cost of Goods Manufactured Schedule**

**For quarter ending March 31**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials used</td>
<td>$378,000</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>$480,000</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td></td>
</tr>
<tr>
<td>Depreciation of manufacturing equipment</td>
<td>$264,000</td>
</tr>
<tr>
<td>Indirect manufacturing labor</td>
<td>$186,000</td>
</tr>
<tr>
<td>Indirect materials</td>
<td>$84,000</td>
</tr>
<tr>
<td>Miscellaneous plant overhead</td>
<td>$135,000</td>
</tr>
<tr>
<td>Plant utilities</td>
<td>$92,400</td>
</tr>
<tr>
<td>Property taxes on building</td>
<td>$28,800</td>
</tr>
<tr>
<td>Total manufacturing costs</td>
<td>$1,648,200</td>
</tr>
</tbody>
</table>

**Manufacturing costs incurred**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add beginning work-in-process inventory</td>
<td>$140,400</td>
</tr>
<tr>
<td>Total manufacturing costs</td>
<td>$1,788,600</td>
</tr>
<tr>
<td>Less ending work-in-process inventory</td>
<td>$(171,000)</td>
</tr>
<tr>
<td>Cost of goods manufactured</td>
<td>$1,617,600</td>
</tr>
</tbody>
</table>
b. Messinger Manufacturing Company  
Cost of Goods Sold Schedule  
For the quarter ending March 31

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning finished goods inventory</td>
<td>$540,000</td>
</tr>
<tr>
<td>Cost of goods manufactured</td>
<td>1,617,600</td>
</tr>
<tr>
<td>Cost of goods available for sale</td>
<td>2,157,600</td>
</tr>
<tr>
<td>Ending finished goods inventory</td>
<td>(510,000)</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>$1,647,600</td>
</tr>
</tbody>
</table>

Diff: 2
Terms: cost of goods manufactured  
Objective: 5  
AACSB: Analytical skills
96) Using the following information find the unknown amounts. Assume each set of information is an independent case.

a. Merchandise Inventory
   - Purchases: $210,000
   - Cost of goods sold: $223,000
   - Beginning balance: $41,000
   - Ending balance: ?

b. Direct Materials
   - Beginning balance: $7,000
   - Ending balance: $14,000
   - Purchases: $48,000
   - Direct materials used: ?

c. Work-in-process Inventory
   - Ending balance: $22,000
   - Cost of goods manufactured: $21,000
   - Beginning balance: $8,000
   - Current manufacturing costs: ?

d. Finished Goods Inventory
   - Cost of goods manufactured: $62,000
   - Ending balance: $20,000
   - Cost of goods sold: $61,000
   - Beginning balance: ?

Answer:

a. Ending balance of merchandise inventory:
   \[ $41,000 + $210,000 - $223,000 = $28,000 \]

b. Direct materials used:
   \[ $7,000 + $48,000 - $14,000 = $41,000 \]

c. Current manufacturing costs:
   \[ $21,000 + $22,000 - $8,000 = $35,000 \]

d. Beginning balance of finished goods inventory:
   \[ $20,000 + $61,000 - $62,000 = $19,000 \]

Diff: 2
Terms: cost of goods manufactured
Objective: 5
AACSB: Analytical skills
97) Each of the following items pertains to one of these companies: Bedell Electronics (a manufacturing company), Gregory Food Retailers (a merchandising company), and Larson Real Estate (a service sector company). Classify each item as either inventoriable (I) costs or period (P) costs.

<table>
<thead>
<tr>
<th></th>
<th>inventoriable (I) costs or period (P) costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Salary of Bedell Electronics president</td>
</tr>
<tr>
<td>b.</td>
<td>Depreciation on Bedell Electronics assembly equipment.</td>
</tr>
<tr>
<td>c.</td>
<td>Salaries of Bedell's assembly line workers</td>
</tr>
<tr>
<td>d.</td>
<td>Purchase of frozen food for sale to customers by Gregory Food Retailers</td>
</tr>
<tr>
<td>e.</td>
<td>Salaries of frozen food personnel at Gregory Food Retailing</td>
</tr>
<tr>
<td>f.</td>
<td>Depreciation on freezers at Gregory Food Retailing</td>
</tr>
<tr>
<td>g.</td>
<td>Salary of a receptionist at Larson Real Estate</td>
</tr>
<tr>
<td>h.</td>
<td>Depreciation on a computer at Larson Real Estate</td>
</tr>
<tr>
<td>i.</td>
<td>Salary of a real estate agent at Larson Real Estate</td>
</tr>
</tbody>
</table>

Answer:

<table>
<thead>
<tr>
<th></th>
<th>inventoriable (I) costs or period (P) costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>Salary of Bedell Electronics president</td>
</tr>
<tr>
<td>b.</td>
<td>Depreciation on Bedell Electronics assembly equipment.</td>
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<td>c.</td>
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</tr>
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<td>d.</td>
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</tr>
<tr>
<td>e.</td>
<td>Salaries of frozen food personnel at Gregory Food Retailing</td>
</tr>
<tr>
<td>f.</td>
<td>Depreciation on freezers at Gregory Food Retailing</td>
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<tr>
<td>g.</td>
<td>Salary of a receptionist at Larson Real Estate</td>
</tr>
<tr>
<td>h.</td>
<td>Depreciation on a computer at Larson Real Estate</td>
</tr>
<tr>
<td>i.</td>
<td>Salary of a real estate agent at Larson Real Estate</td>
</tr>
</tbody>
</table>

Diff: 2
Terms: inventoriable costs, period costs
Objective: 5
AACSB: Analytical skills
On the assembly floor, Cynthia Evans is paid $20 an hour for straight-time and $30 an hour for overtime. One week she worked 43 hours, which included 3 hours of overtime.

**Required:**

a. What is Cynthia's total compensation for the week?
b. What amount of compensation would be reported as direct manufacturing labor?
c. What amount of compensation would be reported as manufacturing overhead?

**Answer:**

a. Direct labor (43 hours × $20) + Overtime premium (3 hrs × $10) = $890  
b. Direct manufacturing labor (43 hours × $20) = $860  
c. Manufacturing overhead costs = Overtime premium (3 hrs × $10) = $30  

**Diff:** 2  
**Terms:** overtime premium  
**Objective:** 5  
**AACSB:** Analytical skills

In the manufacturing plant, Terri Bird is paid $40 an hour for straight-time and $60 an hour for overtime. One week she worked 46 hours, which included 6 hours of overtime, and 4 hours of idle time caused by material shortages.

**Required:**

a. What is Leslie's total compensation for the week?
b. What amount of compensation would be reported as direct manufacturing labor?
c. What amount of compensation would be reported as manufacturing overhead?

**Answer:**

a. Direct manufacturing labor (42 hours × $40) + Idle time (4 hrs × $40) + Overtime premium (6 hrs × $20) = $1,960  
b. Direct manufacturing labor (42 hours × $40) = $1,680  
c. Manufacturing overhead costs = Idle time (4 hrs × $40) + Overtime premium (6 hrs × $20) = $280  

**Diff:** 2  
**Terms:** overtime premium, idle time  
**Objective:** 5  
**AACSB:** Analytical skills
100) Bosely Manufacturing Co. wants to classify costs for the product produced at its facility. The company produces only one product at the facility and operates continually. The cost categories are:

- Product cost
- Prime cost
- Conversion cost
- Period cost

The following costs are found in the accounting records:

a. Quality control inspection wages
b. Raw material purchases
c. Sales commissions
d. Factory depreciation
e. Assembly wages

**Required:**
Assign each of the above costs to the most appropriate cost categories.

**Answer:**
Product cost includes a, b, d, e.

Prime cost includes a, b, e.

Conversion cost includes a, b, e.

Period cost includes c.

**Diff:** 2

Terms: product costs

Objective: 5

AACSB: Analytical skills

101) What is the meaning of the term "cost object"? Give an example of a cost object that would be used in a manufacturing company, a merchandising company, and a service sector company?

**Answer:**
A cost object is anything for which a measurement of costs is desired. An example of a cost object for a manufacturing company might be the cost of manufacturing a particular product. An example of a cost object for a merchandising company might be a particular department of a retail store. An example of a cost object for a service sector company might be the cost to serve or supply a particular customer.

**Diff:** 3

Terms: cost object

Objective: 1, 5

AACSB: Reflective thinking
102) Explain the difference between an inventoriable cost and a period cost. What potential problems does an inaccurate classification of product and period costs cause?
Answer: Inventoriable costs are all costs of a product that are considered as assets in the balance sheet when they are incurred and which become cost of goods sold only when the product is sold. Period costs are treated as expenses of the accounting period in which they are incurred. An inaccurate classification of inventoriable and period costs could lead to violations of the matching principle, which states that costs used in producing revenue should be matched on the income statement when the revenue is recognized. In extreme cases, net income for a given period might be significantly misstated if proper matching does not occur.
Diff: 2
Terms: inventoriable costs
Objective: 5
AACSB: Reflective thinking

Objective 2.6

1) Wages paid to machine operators on an assembly line are classified as a:
A) direct material cost
B) direct manufacturing labor cost
C) manufacturing overhead cost
D) period cost
Answer: B
Diff: 1
Terms: direct manufacturing labor costs
Objective: 6
AACSB: Reflective thinking

2) Product cost for pricing and product-mix decisions may include all costs EXCEPT:
A) research and development costs
B) customer-service costs
C) marketing costs
D) all of the above costs may be included in pricing and product mix decisions.
Answer: D
Diff: 2
Terms: product-mix decisions
Objective: 6
AACSB: Analytical skills

3) Product cost for financial statement purposes may include:
A) all costs allowed by government agencies
B) all costs included for pricing and product-mix decisions
C) production costs
D) all costs except marketing costs
Answer: C
Diff: 2
Terms: inventoriable costs
Objective: 6
AACSB: Reflective thinking
4) Product costs may refer to:
A) inventoriable costs for external reporting  
B) design costs plus manufacturing costs for government contracts  
C) all costs incurred along the value chain for pricing decisions  
D) All of these answers are correct.
Answer: D  
Diff: 3  
Terms: product costs  
Objective: 6  
AACSB: Reflective thinking

5) Product costs used for pricing and product-mix decisions generally include:  
A) manufacturing costs only  
B) design costs plus manufacturing costs  
C) all costs incurred along the value chain  
D) distribution costs only  
Answer: C  
Diff: 3  
Terms: product costs  
Objective: 6  
AACSB: Reflective thinking

6) Product costs used for government contracts generally include:  
A) manufacturing costs only  
B) design costs plus manufacturing costs  
C) all costs incurred along the value chain  
D) distribution costs only  
Answer: B  
Diff: 3  
Terms: product costs  
Objective: 6  
AACSB: Reflective thinking

7) Product costs used for external reporting generally include:  
A) manufacturing costs only  
B) design costs plus manufacturing costs  
C) all costs incurred along the value chain  
D) All of these answers are correct.  
Answer: A  
Diff: 2  
Terms: product costs  
Objective: 6  
AACSB: Reflective thinking
8) Inventoriable costs for external reporting purposes are also called:
A) product costs
B) period costs
C) variable costs
D) direct manufacturing costs
Answer: A
Diff: 1
Terms: inventoriable costs
Objective: 6
AACSB: Reflective thinking

9) For external reporting:
A) costs are classified as either inventoriable or period costs
B) costs reflect current values
C) there are no prescribed rules since no one is exactly sure how investors and creditors will use these numbers
D) costs include amounts that reflect both current and future benefits
Answer: A
Diff: 2
Terms: inventoriable costs, period costs
Objective: 6
AACSB: Reflective thinking

10) Which of the following statements is FALSE?
A) Product costs and inventoriable costs are interchangeable terms.
B) Inventoriable costs are important for GAAP.
C) Inventoriable costs are a special case of period costs.
D) "Product costs" refers to the particular costs of a product for the purpose at hand.
Answer: C
Diff: 3
Terms: product costs, inventoriable costs
Objective: 6
AACSB: Reflective thinking

11) Debated items that some companies include as direct manufacturing labor include:
A) fringe benefits
B) vacation pay
C) training time
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: direct manufacturing labor costs
Objective: 6
AACSB: Reflective thinking
12) Mario Garcia is paid $20 an hour for straight-time and $30 an hour for overtime. One week she worked 42 hours, which included 2 hours of overtime. Compensation would be reported as:
A) $800 of direct labor and $60 of manufacturing overhead
B) $800 of direct labor and $0 of manufacturing overhead
C) $840 of direct labor and $20 of manufacturing overhead
D) $860 of direct labor and $0 of manufacturing overhead
Answer: C
Explanation: C) Direct labor (42 hours × $20) + Overtime premium (2 hrs × $10) = $860
Diff: 2
Terms: overtime premium, direct manufacturing labor costs
Objective: 6
AACSB: Analytical skills

13) Dave Rigby is paid $20 an hour for straight-time and $30 an hour for overtime. One week he worked 45 hours, which included 5 hours of overtime, and 3 hours of idle time caused by material shortages. Compensation would be reported as:
A) $740 of direct labor and $210 of manufacturing overhead
B) $840 of direct labor and $110 of manufacturing overhead
C) $900 of direct labor and $50 of manufacturing overhead
D) $890 of direct labor and $60 of manufacturing overhead
Answer: B
Explanation: B) Direct labor (42 hours × $20) + Idle time (3 hrs × $20) + Overtime premium (5 hrs × $10) = $810
Diff: 3
Terms: overtime premium, direct manufacturing labor costs, idle time
Objective: 6
AACSB: Analytical skills

14) Lou Marinaro worked 44 hours last week for Breakbad Manufacturing. Of the 44 hours 4 hours were considered overtime, and also Marinaro was idle for 5 of the 44 hours due to an equipment malfunction. Marinaro makes $40 per hour and is paid $60 an hour (time and a half) for overtime. Marinaro's total compensation for that week would be ________, and assuming Breakbad charges overtime premium and idle time to indirect labor, the amount of this compensation credited to indirect labor would be ________.
A) $1,680; $80
B) $1,680; $280
C) $1,840; $80
D) $1,840; $280
Answer: D
Explanation: D) total compensation (40 × $40) + (4 × $60) = $1,840;
indirect labor (5 × $40) + (4 × $20) = $280
Diff: 3
Terms: indirect manufacturing costs, overtime premium, idle time
Objective: 6
AACSB: Analytical skills
15) Overtime premium consists of the wages paid to all workers (for both direct labor and indirect labor) in excess of their straight-time wage rates.
Answer: TRUE
Diff: 1
Terms: overtime premium
Objective: 6
AACSB: Reflective thinking

16) A product cost that is useful for one decision may not be useful information for another decision.
Answer: TRUE
Diff: 2
Terms: product costs
Objective: 6
AACSB: Analytical skills

17) For external reporting purposes, indirect manufacturing costs must be allocated to individual units.
Answer: TRUE
Diff: 2
Terms: indirect manufacturing costs, cost allocation
Objective: 6
AACSB: Reflective thinking

18) Overtime premium is normally considered as a component of direct labor.
Answer: FALSE
Explanation: Overtime premium is normally considered as part of indirect labor since it is usually not associated with a particular job.
Diff: 2
Terms: direct manufacturing labor costs, overtime premium
Objective: 6
AACSB: Reflective thinking

19) If a worker is paid for 40 hours, but is idle for 5 of those 40 hours, the 5 hour of idle time would be considered a component of direct labor.
Answer: FALSE
Explanation: Idle time is normally considered a component of indirect labor since it is usually not associated with a particular job.
Diff: 2
Terms: direct manufacturing labor costs, overtime premium
Objective: 6
AACSB: Analytical skills

20) When should the overtime premium of direct manufacturing labor be considered an indirect manufacturing cost? A direct manufacturing cost?
Answer: The overtime premium of direct manufacturing labor should be considered an indirect manufacturing cost when it is attributable to the overall volume of work, and a direct manufacturing cost when a "rush job" is the sole source of the overtime.
Diff: 2
Terms: overtime premium
Objective: 6
AACSB: Reflective thinking
21) In determining product cost, what concerns does a manufacturing firm have when contracting with a government agency?
Answer: Government contracts often reimburse on the basis of "cost of a product" plus a prespecified profit margin. Government agencies provide detailed guidelines on the cost items they allow and disallow when calculating the cost of a product. For example, expenses such as marketing, distribution, and customer service costs may be prohibited.
Diff: 2
Terms: product costs
Objective: 6
AACSB: Reflective thinking

Objective 2.7

1) When making decisions:
A) it is best to use average costs
B) it is best to use unit costs
C) it is best to use total costs rather than unit costs
D) All of these types of costs can be used for decision making; it varies depending on the decision required.
Answer: D
Diff: 2
Terms: average cost, total cost, unit cost
Objective: 7
AACSB: Ethical reasoning

2) Budgeting often plays a major role in affecting behavior and decisions.
Answer: TRUE
Diff: 1
Terms: cost
Objective: 7
AACSB: Ethical reasoning

3) Cost accounting and cost management include calculating various costs, obtaining financial and nonfinancial information, and analyzing relevant information for decision making.
Answer: TRUE
Diff: 1
Terms: cost, variable cost
Objective: 7
AACSB: Reflective thinking

4) A costing system traces direct costs and allocates indirect costs to products.
Answer: TRUE
Diff: 2
Terms: cost tracing, cost allocation
Objective: 7
AACSB: Reflective thinking
5) Management accountants help managers identify which information is relevant to a particular decision.
Answer: TRUE
Diff: 1
Terms: cost
Objective: 7
AACSB: Ethical reasoning

6) When making strategic decisions about which products to produce, managers do NOT need to know how revenues and costs vary with changes in output level.
Answer: FALSE
Explanation: Managers need to know how revenues and costs vary with changes in output level.
Diff: 1
Terms: relevant revenues, relevant costs
Objective: 7
AACSB: Ethical reasoning

7) The following information pertains to Ball Company:

<table>
<thead>
<tr>
<th></th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing costs</td>
<td>$2,400,000</td>
</tr>
<tr>
<td>Units manufactured</td>
<td>40,000</td>
</tr>
<tr>
<td>Beginning inventory</td>
<td>0 units</td>
</tr>
</tbody>
</table>

39,800 units are sold during the year for $100 per unit.

**Required:**

a. What is the average manufacturing cost per unit?

b. What is the amount of ending finished goods inventory?

c. What is the amount of gross margin?

Answer:

a. $2,400,000 / 40,000 = $60.00
b. (40,000 - 39,800) × $60 = $12,000
c. 39,800 × ($100 - $60) = $1,592,000

Diff: 2
Terms: unit cost, finished goods
Objective: 3, 4, 7
AACSB: Analytical skills
Objective 3.1

1) Cost-volume-profit analysis is used primarily by management:
   A) as a planning tool
   B) for control purposes
   C) to prepare external financial statements
   D) to attain accurate financial results
   Answer: A
   Diff: 1
   Terms: cost-volume-profit (CVP)
   Objective: 1
   AACSB: Communication

2) One of the first steps to take when using CVP analysis to help make decisions is:
   A) finding out where the total costs line intersects with the total revenues line on a graph.
   B) identifying which costs are variable and which costs are fixed.
   C) calculation of the degree of operating leverage for the company.
   D) estimating how many products will have to be sold to make a decent profit.
   Answer: B
   Diff: 1
   Terms: cost-volume-profit (CVP) analysis
   Objective: 1
   AACSB: Reflective thinking

3) Cost-volume-profit analysis assumes all of the following EXCEPT:
   A) all costs are variable or fixed
   B) units manufactured equal units sold
   C) total variable costs remain the same over the relevant range
   D) total fixed costs remain the same over the relevant range
   Answer: C
   Diff: 2
   Terms: cost-volume-profit (CVP)
   Objective: 1
   AACSB: Reflective thinking
4) Which of the following items is NOT an assumption of CVP analysis?
A) Total costs can be divided into a fixed component and a component that is variable with respect to the level of output.
B) When graphed, total costs curve upward.
C) The unit-selling price is known and constant.
D) All revenues and costs can be added and compared without taking into account the time value of money.
Answer:  B
Diff: 3
Terms: cost-volume-profit (CVP)
Objective: 1
AACSB: Reflective thinking

5) Which of the following items is NOT an assumption of CVP analysis?
A) Costs may be separated into separate fixed and variable components.
B) Total revenues and total costs are linear in relation to output units.
C) Unit selling price, unit variable costs, and unit fixed costs are known and remain constant.
D) Proportion of different products will remain constant when multiple products are sold.
Answer:  C
Diff: 3
Terms: cost-volume-profit (CVP)
Objective: 1
AACSB: Reflective thinking

6) A revenue driver is defined as:
A) any factor that affects costs and revenues
B) any factor that affects revenues
C) only factors that can influence a change in selling price
D) only factors that can influence a change in demand
Answer:  B
Diff: 1
Terms: revenue driver
Objective: 1
AACSB: Reflective thinking

7) Operating income calculations use:
A) net income
B) income tax expense
C) cost of goods sold and operating costs
D) nonoperating revenues and nonoperating expenses
Answer:  C
Diff: 2
Terms: revenue driver
Objective: 1
AACSB: Reflective thinking
8) Which of the following statements about net income (NI) is true?
A) NI = operating income plus nonoperating revenue.
B) NI = operating income plus operating costs.
C) NI = operating income less income taxes.
D) NI = operating income less cost of goods sold.
Answer: C
Diff: 1
Terms: net income
Objective: 1
AACSB: Reflective thinking

9) Which of the following is true about the assumptions underlying basic CVP analysis?
A) Only selling price is known and constant.
B) Only selling price and variable cost per unit are known and constant.
C) Only selling price, variable cost per unit, and total fixed costs are known and constant.
D) Selling price, variable cost per unit, fixed cost per unit, and total fixed costs are known and constant.
Answer: C
Diff: 2
Terms: cost-volume-profit (CVP)
Objective: 1
AACSB: Reflective thinking

10) The contribution income statement:
A) reports gross margin
B) is allowed for external reporting to shareholders
C) categorizes costs as either direct or indirect
D) can be used to predict future profits at different levels of activity
Answer: D
Diff: 1
Terms: contribution income statement
Objective: 1
AACSB: Reflective thinking

11) Contribution margin equals:
A) revenues minus period costs
B) revenues minus product costs
C) revenues minus variable costs
D) revenues minus fixed costs
Answer: C
Diff: 1
Terms: contribution margin
Objective: 1
AACSB: Reflective thinking
Answer the following questions using the information below:

Sherry's Custom Jewelry sells a single product. 700 units were sold resulting in $7,000 of sales revenue, $2,800 of variable costs, and $1,200 of fixed costs.

12) Contribution margin per unit is:
A) $4.00
B) $4.29
C) $6.00
D) None of these answers are correct.
Answer: C
Explanation: C) ($7,000 - $2,800) / 700 units = $6 per unit
Diff: 2
Terms: contribution margin per unit
Objective: 1
AACSB: Analytical skills

13) If sales increase by $25,000, operating income will increase by:
A) $10,000
B) $15,000
C) $22,200
D) None of these answers are correct.
Answer: B
Explanation: B) [(7,000 - 2,800) / 7,000] × $25,000 = $15,000
Diff: 2
Terms: cost-volume-profit (CVP) analysis
Objective: 1
AACSB: Analytical skills

Answer the following questions using the information below:

Holly's Ham, Inc. sells hams during the major holiday seasons. During the current year 11,000 hams were sold resulting in $220,000 of sales revenue, $55,000 of variable costs, and $24,000 of fixed costs.

14) Contribution margin per ham is:
A) $5.00
B) $15.00
C) $20.00
D) None of these answers are correct.
Answer: B
Explanation: B) ($220,000 - $55,000) / 11,000 hams = $15 per ham
Diff: 2
Terms: contribution margin per unit
Objective: 1
AACSB: Analytical skills
15) If sales increase by $40,000, operating income will increase by:
A) $10,000
B) $20,000
C) $30,000
D) None of these answers are correct.
Answer: C
Explanation: C) Price = $220,000/11,000 = $20.00
Sales in hams = $40,000/$20.00 = 2,000 hams
Operating Income increase = 2,000 hams x $15.00 per = $30,000
Diff: 2
Terms: cost-volume-profit (CVP) analysis
Objective: 1
AACSB: Analytical skills

16) Kenefic Company sells its only product for $9 per unit, variable production costs are $3 per unit, and
selling and administrative costs are $1.50 per unit. Fixed costs for 10,000 units are $5,000. The
contribution margin is:
A) $6 per unit
B) $4.50 per unit
C) $5.50 per unit
D) $4 per unit
Answer: B
Explanation: B) $9 - $3 - $1.60 = $4.50
Diff: 2
Terms: cost-volume-profit (CVP) analysis
Objective: 1
AACSB: Analytical skills

17) The contribution income statement highlights:
A) gross margin
B) products costs and period costs
C) different product lines
D) variable and fixed costs
Answer: D
Diff: 2
Terms: contribution income statement
Objective: 1
AACSB: Communication
18) Fixed costs equal $12,000, unit contribution margin equals $20, and the number of units sold equal 1,600. Operating income is:
A) $12,000
B) $20,000
C) $32,000
D) $40,000
Answer: B
Explanation: B) (1,600 × $20) - $12,000 = $20,000
Diff: 3
Terms: cost-volume-profit (CVP) analysis
Objective: 1
AACSB: Analytical skills

19) If selling price per unit is $30, variable costs per unit are $20, total fixed costs are $10,000, the tax rate is 30%, and the company sells 5,000 units, net income is:
A) $12,000
B) $14,000
C) $28,000
D) $40,000
Answer: C
Explanation: C) [((30 - 20) × 5,000) - $10,000] × (1.0 - .3) = $28,000
Diff: 2
Terms: cost-volume-profit (CVP) analysis
Objective: 1
AACSB: Analytical skills
Answer the following questions using the information below:

Northenscold Company sells several products. Information of average revenue and costs is as follows:

<table>
<thead>
<tr>
<th>Selling price per unit</th>
<th>$20.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable costs per unit:</td>
<td></td>
</tr>
<tr>
<td>Direct material</td>
<td>$4.00</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>$1.60</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>$0.40</td>
</tr>
<tr>
<td>Selling costs</td>
<td>$2.00</td>
</tr>
<tr>
<td>Annual fixed costs</td>
<td>$96,000</td>
</tr>
</tbody>
</table>

20) The contribution margin per unit is:
A) $6
B) $8
C) $12
D) $14
Answer: C
Explanation: C) $20 - $4 - $1.60 - $0.40 - $2 = $12
Diff: 2
Terms: contribution margin per unit
Objective: 1
AACSB: Analytical skills

21) All of the following are assumed in the above analysis EXCEPT:
A) a constant product mix
B) fixed costs increase when activity increases
C) cost and revenue relationships are reflected accurately
D) all costs can be classified as either fixed or variable
Answer: B
Diff: 2
Terms: cost-volume-profit (CVP) analysis
Objective: 1
AACSB: Reflective thinking
Answer the following questions using the information below:

Franscioso Company sells several products. Information of average revenue and costs is as follows:

<table>
<thead>
<tr>
<th>Selling price per unit</th>
<th>$28.50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable costs per unit:</td>
<td></td>
</tr>
<tr>
<td>Direct material</td>
<td>$5.25</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>$1.15</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>$0.25</td>
</tr>
<tr>
<td>Selling costs</td>
<td>$1.85</td>
</tr>
<tr>
<td>Annual fixed costs</td>
<td>$110,000</td>
</tr>
</tbody>
</table>

22) The contribution margin per unit is:
A) $15  
B) $20  
C) $22  
D) $125  
Answer: B  
Explanation: B) $28.50 - $5.25 - $1.15 - $0.25 - $1.85  
Diff: 2  
Terms: contribution margin per unit  
Objective: 1  
AACSB: Analytical skills

23) All of the following are assumed in the above analysis EXCEPT:
A) a constant product mix  
B) all costs can be classified as either fixed or variable  
C) cost and revenue relationships are reflected accurately  
D) per unit variable costs increase when activity increases  
Answer: D  
Diff: 2  
Terms: cost-volume-profit (CVP) analysis  
Objective: 1  
AACSB: Analytical skills
Dr. Charles Hunter, MD, performs a certain outpatient procedure for $1,000. His fixed costs are $20,000, while his variable costs are $500 per procedure. Dr. Hunter currently plans to perform 200 procedures this month.

24) What is the budgeted revenue for the month assuming that Dr. Hunter plans to perform this procedure 200 times?
A) $100,000
B) $200,000
C) $300,000
D) $400,000
Answer: B
Explanation: B) 200 × $1,000 = $200,000
Diff: 1
Terms: cost-volume-profit (CVP) analysis
Objective: 1
AACSB: Analytical skills

25) What is the budgeted operating income for the month assuming that Dr. Hunter plans to perform the procedure 200 times?
A) $200,000
B) $100,000
C) $80,000
D) $40,000
Answer: C
Explanation: C) $200,000 - [(200 × $500) + $20,000]; $200,000 - $120,000 = $80,000
Diff: 1
Terms: cost-volume-profit (CVP) analysis
Objective: 1
AACSB: Analytical skills

Answer the following questions using the information below:

Nancy's Niche sells a single product. 8,000 units were sold resulting in $80,000 of sales revenue, $20,000 of variable costs, and $10,000 of fixed costs.

26) The contribution margin percentage is:
A) 12.5%
B) 25.0%
C) 37.5%
D) 75.0%
Answer: D
Explanation: D) ($80,000 - $20,000) / $80,000 = 75%
Diff: 2
Terms: contribution margin percentage
Objective: 1
AACSB: Analytical skills
27) To achieve $100,000 in operating income, sales must total:
A) $440,000
B) $160,000
C) $130,000
D) None of these answers are correct.
Answer: D
Explanation: D) $(100,000 + 10,000) / 75% = $146,667 in sales
Diff: 2
Terms: cost-volume-profit (CVP) analysis
Objective: 1
AACSB: Analytical skills

28) Gross margin is:
A) sales revenue less variable costs
B) sales revenue less cost of goods sold
C) contribution margin less fixed costs
D) contribution margin less variable costs
Answer: B
Diff: 1
Terms: gross margin percentage
Objective: 1
AACSB: Reflective thinking

29) In the merchandising sector:
A) only variable costs are subtracted to determine gross margin
B) fixed overhead costs are subtracted to determine gross margin
C) fixed overhead costs are subtracted to determine contribution margin
D) all operating costs are subtracted to determine contribution margin
Answer: A
Diff: 2
Terms: gross margin percentage
Objective: 1
AACSB: Reflective thinking

30) In the manufacturing sector:
A) only variable costs are subtracted to determine gross margin
B) fixed overhead costs are subtracted to determine gross margin
C) fixed overhead costs are subtracted to determine contribution margin
D) all operating costs are subtracted to determine contribution margin
Answer: B
Diff: 2
Terms: gross margin percentage
Objective: 1
AACSB: Reflective thinking
31) To determine contribution margin use:
A) only variable manufacturing costs
B) only fixed manufacturing costs
C) both variable and fixed manufacturing costs
D) both variable manufacturing costs and variable nonmanufacturing costs
Answer: D
Diff: 2
Terms: contribution margin
Objective: 1
AACSB: Reflective thinking

32) To perform cost-volume-profit analysis, a company must be able to separate costs into fixed and variable components.
Answer: TRUE
Diff: 1
Terms: cost-volume-profit (CVP) analysis
Objective: 1
AACSB: Analytical skills

33) Contribution margin = Contribution margin percentage * Revenues (in dollars)
Answer: TRUE
Diff: 1
Terms: contribution margin
Objective: 1
AACSB: Analytical skills

34) It is assumed in CVP analysis that the unit selling price, unit variable costs, and unit fixed costs are known and constant.
Answer: FALSE
Explanation: It is assumed in CVP analysis that the unit selling price, unit variable costs, and total fixed costs are known and constant.
Diff: 2
Terms: cost-volume-profit (CVP) analysis
Objective: 1
AACSB: Analytical skills

35) In CVP analysis, the number of output units is the only revenue driver.
Answer: TRUE
Diff: 2
Terms: cost-volume-profit (CVP) analysis, revenue driver
Objective: 1
AACSB: Reflective thinking

36) Many companies find even the simplest CVP analysis helps with strategic and long-range planning.
Answer: TRUE
Diff: 1
Terms: cost-volume-profit (CVP) analysis
Objective: 1
AACSB: Analytical skills
37) The difference between total revenues and total variable costs is called contribution margin.
Answer: TRUE
Diff: 2
Terms: contribution margin
Objective: 1
AACSB: Reflective thinking

38) In CVP analysis, variable costs include direct variable costs, but do NOT include indirect variable costs.
Answer: FALSE
Explanation: In CVP analysis variable costs include direct variable costs and indirect variable costs.
Diff: 2
Terms: cost-volume-profit (CVP) analysis
Objective: 1
AACSB: Reflective thinking

39) In CVP analysis, an assumption is made that the total revenues are linear with respect to output units, but that total costs are non-linear with respect to output units.
Answer: FALSE
Explanation: In CVP analysis, an assumption is made that the total revenues and the total costs are non-linear with respect to output units.
Diff: 2
Terms: cost-volume-profit (CVP) analysis
Objective: 1
AACSB: Reflective thinking

40) A revenue driver is defined as a variable that causes changes in prices.
Answer: FALSE
Explanation: A revenue driver is defined as a variable that causes changes in revenues.
Diff: 2
Terms: revenue driver
Objective: 1
AACSB: Reflective thinking

41) If the selling price per unit is $50 and the contribution margin percentage is 40%, then the variable cost per unit must be $20.
Answer: FALSE
Explanation: Then the variable cost per unit must be $30, \(\$50 - (.40 \times \$50)\) = $30.
Diff: 2
Terms: contribution margin
Objective: 1
AACSB: Analytical skills

42) Total revenues less total fixed costs equal the contribution margin.
Answer: FALSE
Explanation: Total revenues less total variable costs equal the contribution margin.
Diff: 1
Terms: contribution margin
Objective: 1
AACSB: Reflective thinking
43) Gross margin is reported on the contribution income statement.
Answer: FALSE
Explanation: Gross margin is reported on the absorption costing income statement.
Diff: 1
Terms: contribution income statement
Objective: 1
AACSB: Analytical skills

44) If the selling price per unit of a product is $30, variable costs per unit are $20, and total fixed costs are $10,000 and a company sells 5,000 units, operating income would be $40,000.
Answer: TRUE
Diff: 2
Terms: contribution income statement
Objective: 1
AACSB: Analytical skills

45) Service sector companies will never report gross margin on an income statement.
Answer: TRUE
Diff: 2
Terms: gross margin percentage
Objective: 1
AACSB: Communication

46) For merchandising firms, contribution margin will always be a lesser amount than gross margin.
Answer: TRUE
Explanation: True, because all variable costs are subtracted to compute contribution margin, but only COGS is subtracted to compute gross margin.
Diff: 3
Terms: contribution margin
Objective: 1
AACSB: Analytical skills

47) Contribution margin and gross margin are terms that can be used interchangeably.
Answer: FALSE
Explanation: Contribution margin and gross margin refer to different amounts.
Revenues - all variable costs = contribution margin; Revenues - COGS = gross margin
Diff: 1
Terms: contribution margin
Objective: 1
AACSB: Communication

48) Gross Margin will always be greater than contribution margin.
Answer: FALSE
Explanation: If variable costs are low and/or manufacturing fixed costs are high, then contribution margin can easily be greater than gross margin.
Revenues - all variable costs = contribution margin; Revenues - COGS = gross margin
Diff: 1
Terms: contribution margin
Objective: 1
AACSB: Reflective thinking
49) Jacob’s Manufacturing sales is equal to production. If Jacob’s Manufacturing presented a Financial Accounting Income Statement emphasizing gross margin showing operating income of $180,000, a Contribution Income Statement emphasizing contribution margin would show a different operating income.  
Answer: FALSE  
Explanation: If Jacob’s Manufacturing presented a Financial Accounting Income Statement emphasizing gross margin showing operating income of $180,000, a Contribution Income Statement emphasizing contribution margin would show the same operating income.  
Diff: 2  
Terms: contribution income statement  
Objective: 1  
AACSB: Communication

50) Jennifer’s Stuffed Animals reported the following:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$2,000</td>
</tr>
<tr>
<td>Variable manufacturing costs</td>
<td>$400</td>
</tr>
<tr>
<td>Variable nonmanufacturing costs</td>
<td>$460</td>
</tr>
<tr>
<td>Fixed manufacturing costs</td>
<td>$300</td>
</tr>
<tr>
<td>Fixed nonmanufacturing costs</td>
<td>$280</td>
</tr>
</tbody>
</table>

**Required:**  
a. Compute contribution margin.  
b. Compute gross margin.  
c. Compute operating income.  
Answer:  
a. Contribution margin $2,000 - $400 - $460 = $1,140  
b. Gross margin $2,000 - $400 - $300 = $1,300  
c. Operating income $2000 - $400 - $460 - $300 - $280 = $560  
Diff: 2  
Terms: contribution margin  
Objective: 1  
AACSB: Analytical skills
51) Arthur's Plumbing reported the following:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$4,500</td>
</tr>
<tr>
<td>Variable manufacturing costs</td>
<td>$ 900</td>
</tr>
<tr>
<td>Variable nonmanufacturing costs</td>
<td>$ 810</td>
</tr>
<tr>
<td>Fixed manufacturing costs</td>
<td>$ 630</td>
</tr>
<tr>
<td>Fixed nonmanufacturing costs</td>
<td>$ 545</td>
</tr>
</tbody>
</table>

Required:

a. Compute contribution margin.
b. Compute contribution margin percentage.
c. Compute gross margin.
d. Compute gross margin percentage.
e. Compute operating income.

Answer:

a. Contribution margin $4,500 - $900 - $810 = $2,790
b. Contribution margin percentage = ($2,790/$4,500) x 100 = 62%
c. Gross margin $4,500 - $900 - $630 = $2,970
d. Gross margin percentage = ($2,970/$4,500) x 100 = 66%
e. Operating income $4,500 - $900 - $810 - $630 - $545 = $1,615

Diff: 2

Terms: contribution margin percentage, gross margin percentage

Objective: 1

AACSB: Analytical skills

Objective 3.2

1) The selling price per unit less the variable cost per unit is the:
   A) fixed cost per unit
   B) gross margin
   C) margin of safety
   D) contribution margin per unit

Answer: D

Diff: 1

Terms: contribution margin

Objective: 2

AACSB: Reflective thinking

Answer the following questions using the information below:

Sherry's Custom Jewelry sells a single product. 700 units were sold resulting in $7,000 of sales revenue, $2,800 of variable costs, and $1,200 of fixed costs.
2) Breakeven point in units is:
A) 200 units  
B) 300 units  
C) 500 units  
D) None of these answers are correct.  
Answer: A  
Explanation:  A) ($7,000 - $2,800)/700 = $6 Contribution Margin Per Unit.  $1,200/$6 = 200 units  
Diff: 2  
Terms: breakeven point (BEP)  
Objective: 2  
AACSB: Analytical skills

3) The number of units that must be sold to achieve $6,000 of operating income is:
A) 1,000 units 
B) 1,166 units 
C) 1,200 units 
D) None of these answers are correct. 
Answer: C  
Explanation:  C) ($7,000 - $2,800)/700 = $6.  ($1,200 + $6,000)/$6 = 1,200 units  
Diff: 2  
Terms: cost-volume-profit (CVP) analysis  
Objective: 2  
AACSB: Analytical skills

Answer the following questions using the information below:

Holly's Ham, Inc. sells hams during the major holiday seasons. During the current year 11,000 hams were sold resulting in $220,000 of sales revenue, $55,000 of variable costs, and $24,000 of fixed costs.

4) Breakeven point in units is:
A) 1,000 hams  
B) 1,200 hams  
C) 1,600 hams  
D) None of these answers are correct.  
Answer: C  
Diff: 2  
Terms: breakeven point (BEP)  
Objective: 2  
AACSB: Analytical skills
5) The number of hams that must be sold to achieve $75,000 of operating income is:
A) 6,600 hams  
B) 7,500 hams  
C) 8,400 hams  
D) None of these answers are correct. 
Answer: A 
Explanation: A) 20X -5X - 24,000 = 75,000; X = 6,600 hams 
Diff: 2 
Terms: cost-volume-profit (CVP) analysis 
Objective: 2 
AACSB: Analytical skills 

6) At the breakeven point of 2,000 units, variable costs total $4,000 and fixed costs total $6,000. The 2,001st unit sold will contribute ________ to profits. 
A) $1  
B) $2  
C) $3  
D) $5 
Answer: C 
Explanation: C) Fixed costs of $6,000/2,000 units = Contribution Margin of $3 per unit. 
Diff: 3 
Terms: contribution margin 
Objective: 2 
AACSB: Analytical skills 

7) The breakeven point is the activity level where: 
A) revenues equal fixed costs 
B) revenues equal variable costs 
C) contribution margin equals variable costs 
D) revenues equal the sum of variable and fixed costs 
Answer: D 
Diff: 3 
Terms: breakeven point (BEP) 
Objective: 2 
AACSB: Reflective thinking 

8) Breakeven point is: 
A) total costs divided by variable costs per unit 
B) contribution margin per unit divided by revenue per unit 
C) fixed costs divided by contribution margin per unit 
D) the sum of fixed and variable costs divided by contribution margin per unit 
Answer: C 
Diff: 2 
Terms: breakeven point (BEP) 
Objective: 2 
AACSB: Reflective thinking
9) Sales total $200,000 when variable costs total $150,000 and fixed costs total $30,000. The breakeven point in sales dollars is:
A) $200,000  
B) $120,000  
C) $ 40,000  
D) $ 30,000  
Answer: B  
Explanation: B) ($200,000 - $150,000) / $200,000 = 25% CM%; $30,000 / 0.25 = $120,000 BE sales  
Diff: 3  
Terms: breakeven point (BEP)  
Objective: 2  
AACSB: Analytical skills

10) The breakeven point in CVP analysis is defined as:
A) when fixed costs equal total revenues  
B) fixed costs divided by the contribution margin per unit  
C) revenues less variable costs equal operating income  
D) when the contribution margin percentage equals total revenues divided by variable costs  
Answer: B  
Diff: 2  
Terms: breakeven point (BEP)  
Objective: 2  
AACSB: Reflective thinking

11) Which of the following statements about determining the breakeven point is FALSE?
A) Operating income is equal to zero.  
B) Contribution margin - fixed costs is equal to zero.  
C) Revenues equal fixed costs plus variable costs.  
D) Breakeven revenues equal fixed costs divided by the variable cost per unit.  
Answer: D  
Diff: 3  
Terms: breakeven point (BEP)  
Objective: 2  
AACSB: Reflective thinking

12) What is the breakeven point in units, assuming a product's selling price is $100, fixed costs are $8,000, unit variable costs are $20, and operating income is $3,200?
A) 100 units  
B) 300 units  
C) 400 units  
D) 500 units  
Answer: A  
Explanation: A) Unit Selling Price of $100 - Unit Variable Cost $20 = Unit Contribution Margin of $80. Fixed Costs of $8,000 / $80 = 100 units  
Diff: 2  
Terms: breakeven point (BEP)  
Objective: 2  
AACSB: Analytical skills
13) If unit outputs exceed the breakeven point:
A) there is a loss
B) total sales revenue exceeds total costs
C) there is a profit
D) Both total sales revenue exceeds total costs and there is a profit.
Answer: D
Diff: 2
Terms: breakeven point (BEP)
Objective: 2
AACSB: Reflective thinking

14) How many units would have to be sold to yield a target operating income of $22,000, assuming variable costs are $15 per unit, total fixed costs are $2,000, and the unit selling price is $20?
A) 4,800 units
B) 4,400 units
C) 4,000 units
D) 3,600 units
Answer: A
Explanation: A) \( \frac{2,000 + 22,000}{20 - 15} = 4,800 \) units
Diff: 3
Terms: cost-volume-profit (CVP) analysis
Objective: 2
AACSB: Analytical skills

15) If the breakeven point is 1,000 units and each unit sells for $50, then:
A) selling 1,250 units will result in a profit
B) sales of $40,000 will result in a loss
C) sales of $50,000 will result in zero profit
D) All of these answers are correct.
Answer: D
Explanation: D) \( 1,000 \times 50 - 50,000 \) of BE sales
Diff: 2
Terms: breakeven point (BEP)
Objective: 2
AACSB: Analytical skills

16) If breakeven point is 1,000 units, each unit sells for $30, and fixed costs are $10,000, then on a graph the:
A) total revenue line and the total cost line will intersect at $30,000 of revenue
B) total cost line will be zero at zero units sold
C) revenue line will start at $10,000
D) All of these answers are correct.
Answer: A
Diff: 2
Terms: breakeven point (BEP)
Objective: 2
AACSB: Analytical skills
17) When fixed costs are $40,000 and variable costs are 20% of the selling price, then breakeven sales are:
A) $40,000
B) $50,000
C) $200,000
D) indeterminable
Answer: B
Explanation: B) $40,000 / (1 - 0.20) = $50,000 in BE sales
Diff: 2
Terms: breakeven point (BEP)
Objective: 2
AACSB: Analytical skills

18) What is the contribution margin per ticket package?
A) $50
B) $100
C) $150
D) $200
Answer: A
Explanation: A) $200 - $150 = $50
Diff: 1
Terms: contribution margin per unit
Objective: 2
AACSB: Analytical skills

19) How many ticket packages will Ruben need to sell to break even?
A) 34 packages
B) 50 packages
C) 100 packages
D) 150 packages
Answer: C
Explanation: C) $200X - $150X - $5,000 = 0; X = 100
Diff: 2
Terms: breakeven point (BEP)
Objective: 2
AACSB: Analytical skills
20) How many ticket packages will Ruben need to sell in order to achieve $60,000 of operating income?
A) 367 packages
B) 434 packages
C) 1,100 packages
D) 1,300 packages
Answer: D
Explanation: D) $200X - $150X - $5,000 = $60,000; X = 1,300
Diff: 2
Terms: cost-volume-profit (CVP) analysis
Objective: 2
AACSB: Analytical skills

21) For every $25,000 of ticket packages sold, operating income will increase by:
A) $6,250
B) $12,500
C) $18,750
D) an indeterminable amount
Answer: A
Explanation: A) $25,000 × [(200 - 150)/200] = $6,250
Diff: 3
Terms: cost-volume-profit (CVP) analysis
Objective: 2
AACSB: Analytical skills

Answer the following questions using the information below:

Northenscold Company sells several products. Information of average revenue and costs is as follows:

<table>
<thead>
<tr>
<th>Selling price per unit</th>
<th>$20.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable costs per unit:</td>
<td></td>
</tr>
<tr>
<td>Direct material</td>
<td>$4.00</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>$1.60</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>$0.40</td>
</tr>
<tr>
<td>Selling costs</td>
<td>$2.00</td>
</tr>
<tr>
<td>Annual fixed costs</td>
<td>$96,000</td>
</tr>
</tbody>
</table>

22) The number of units that Northenscold's must sell each year to break even is:
A) 8,000 units
B) 12,000 units
C) 16,000 units
D) indeterminable
Answer: A
Explanation: A) $20X - $8X - $96,000 = 0; X = 8,000 units
Diff: 2
Terms: breakeven point (BEP)
Objective: 2
AACSB: Analytical skills
23) The number of units that Northenscold's must sell annually to make a profit of $144,000 is:
A) 12,000 units  
B) 18,000 units  
C) 20,000 units  
D) 30,000 units  
Answer: C  
Explanation: C) $20X - $8X - $96,000 = $144,000; X = 20,000 units  
Diff: 2  
Terms: cost-volume-profit (CVP) analysis  
Objective: 2  
AACSB: Analytical skills

24) The number of units that Franscioso must sell each year to break even is:
A) 1,000 units  
B) 4,000 units  
C) 5,500 units  
D) indeterminable  
Answer: C  
Explanation: C) 28.5 X - 8.5 X - 110,000 = 0; X = 5,500 units  
Diff: 2  
Terms: breakeven point (BEP)  
Objective: 2  
AACSB: Analytical skills

25) The number of units that Franscioso must sell annually to make a profit of $90,000 is:
A) 10,000 units  
B) 12,000 units  
C) 15,000 units  
D) 20,000 units  
Answer: A  
Explanation: A) 28.5 X - 8.5 X - 90,000 = 0; X = 10,000 units  
Diff: 2  
Terms: cost-volume-profit (CVP) analysis  
Objective: 2  
AACSB: Analytical skills
Answer the following questions using the information below:

The following information is for Nichols Company:

<table>
<thead>
<tr>
<th>Selling price</th>
<th>$50 per unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable costs</td>
<td>$30 per unit</td>
</tr>
<tr>
<td>Total fixed costs</td>
<td>$100,000</td>
</tr>
</tbody>
</table>

26) The number of units that Nichols Company must sell to reach targeted operating income of $30,000 is:

A) 5,000 units  
B) 6,500 units  
C) 3,334 units  
D) 4,334 units

Answer: B  
Explanation: B) \( \frac{\$100,000 + \$30,000}{\$50 - \$30} = 6,500 \) units

Diff: 2  
Terms: cost-volume-profit (CVP) analysis  
Objective: 2  
AACSB: Analytical skills

27) If targeted operating income is $40,000, then targeted sales revenue is:

A) $350,000  
B) $233,333  
C) $166,667  
D) $250,000

Answer: A  
Explanation: A) \( \frac{\$100,000 + \$40,000}{\left[\frac{\$50 - \$30}{\$50}\right]} = \$350,000 \)

Diff: 2  
Terms: cost-volume-profit (CVP) analysis  
Objective: 2  
AACSB: Analytical skills

Answer the following questions using the information below:

Stephanie's Bridal Shoppe sells wedding dresses. The average selling price of each dress is $1,000, variable costs are $400, and fixed costs are $90,000.

28) What is the Bridal Shoppe's operating income when 200 dresses are sold?

A) $30,000  
B) $80,000  
C) $200,000  
D) $100,000

Answer: A  
Explanation: A) \( 200(\$1,000) - 200(\$400) - \$90,000 = \$30,000 \)

Diff: 2  
Terms: cost-volume-profit (CVP) analysis  
Objective: 2  
AACSB: Analytical skills
29) How many dresses are sold when operating income is zero?
A) 225 dresses
B) 150 dresses
C) 100 dresses
D) 90 dresses
Answer: B
Explanation: B) $1,000N - $400N - $90,000 = 0; $600N = $90,000; N = 150 dresses
Diff: 2
Terms: cost-volume-profit (CVP) analysis
Objective: 2
AACSB: Analytical skills

Answer the following questions using the information below:

Dr. Charles Hunter, MD, performs a certain outpatient procedure for $1,000. His fixed costs are $20,000, while his variable costs are $500 per procedure. Dr. Hunter currently plans to perform 200 procedures this month.

30) What is the breakeven point for the month assuming that Dr. Hunter plans to perform the procedure 200 times?
A) 40 times
B) 30 times
C) 20 times
D) 10 times
Answer: A
Explanation: A) $1,000N - $500N - $20,000 = 0; $500N = $20,000; N = 40 times
Diff: 2
Terms: breakeven point (BEP)
Objective: 2
AACSB: Analytical skills

Answer the following questions using the information below:

Nancy's Niche sells a single product. 8,000 units were sold resulting in $80,000 of sales revenue, $20,000 of variable costs, and $10,000 of fixed costs.

31) The breakeven point in total sales dollars is:
A) $40,000
B) $13,334
C) $100,000
D) None of these answers are correct.
Answer: B
Explanation: B) $10,000 / 0.75 = $13,334 (rounded up)
Diff: 2
Terms: breakeven point (BEP)
Objective: 2
AACSB: Analytical skills
Answer the following questions using the information below:

Martha Manufacturing produces a single product that sells for $80. Variable costs per unit equal $32. The company expects total fixed costs to be $72,000 for the next month at the projected sales level of 2,000 units. In an attempt to improve performance, management is considering a number of alternative actions. Each situation is to be evaluated separately.

32) What is the current breakeven point in terms of number of units?
A) 1,500 units
B) 2,250 units
C) 3,333 units
D) None of these answers are correct.
Answer: A
Explanation: A) $80X - $32X - $72,000 = 0; X = 1,500 units
Diff: 2
Terms: breakeven point (BEP)
Objective: 2
AACSB: Analytical skills

Answer the following questions using the information below:

Bush Manufacturing produces a single product that sells for $100. Variable costs per unit equal $25. The company expects total fixed costs to be $60,000 for the next month at the projected sales level of 1,000 units. In an attempt to improve performance, management is considering a number of alternative actions. Each situation is to be evaluated separately.

33) What is the current breakeven point in terms of number of units?
A) 800 units
B) 900 units
C) 2,400 units
D) None of these answers are correct.
Answer: A
Explanation: A) $60,000/($100-$25)
Diff: 2
Terms: breakeven point (BEP)
Objective: 2
AACSB: Analytical skills

34) The selling price per unit is $25, variable cost per unit $15, and fixed cost per unit is $4. When this company operates above the breakeven point, the sale of one more unit will increase net income by $6. The sale of one more unit will increase net income by $10, ($25 - $15 = $10).
Answer: FALSE
Explanation: The sale of one more unit will increase net income by $10, ($25 - $15 = $10).
Diff: 2
Terms: contribution income statement
Objective: 2
AACSB: Analytical skills
35) A company with sales of $50,000, variable costs of $35,000, and fixed costs of $25,000 will reach its breakeven point if sales are increased by $20,000.
Answer: FALSE
Explanation: $25,000 / 0.30 = $83,333 of total sales are needed to break even.
Diff: 2
Terms: breakeven point (BEP)
Objective: 2
AACSB: Analytical skills

36) Breakeven point is NOT a good planning tool since the goal of business is to make a profit.
Answer: FALSE
Explanation: Breakeven point is an important planning tool that helps managers determine volume of sales/production needed to be profitable.
Diff: 2
Terms: breakeven point (BEP)
Objective: 2
AACSB: Reflective thinking

37) Breakeven point is that quantity of output where total revenues equal total costs.
Answer: TRUE
Diff: 1
Terms: breakeven point (BEP)
Objective: 2
AACSB: Reflective thinking

38) In the graph method of CVP analysis, the breakeven point is the (X-axis) quantity of units sold for which the total revenues line crosses the total costs line.
Answer: TRUE
Diff: 1
Terms: breakeven point (BEP)
Objective: 2
AACSB: Reflective thinking

39) In the graph method of CVP analysis, the total revenue line can be calculated by determining the total revenue at only one real output level because the starting point of the line is always the intersection of the X and Y axes.
Answer: TRUE
Diff: 1
Terms: breakeven point (BEP)
Objective: 2
AACSB: Reflective thinking

40) A profit-volume graph shows the impact on operating income from changes in the output level.
Answer: TRUE
Diff: 1
Terms: PV Graph
Objective: 2
AACSB: Reflective thinking
41) If the selling price per unit of a product is $50, variable costs per unit are $40, and total fixed costs are $50,000, a company must sell 6,000 units to make a target operating income of $10,000.
Answer: TRUE
Diff: 3
Terms: cost-volume-profit (CVP) analysis
Objective: 2
AACSB: Analytical skills

42) Gilley, Inc., sells a single product. The company's most recent income statement is given below.

<table>
<thead>
<tr>
<th>Sales (4,000 units)</th>
<th>$120,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less variable expenses</td>
<td>(68,000)</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>52,000</td>
</tr>
<tr>
<td>Less fixed expenses</td>
<td>(40,000)</td>
</tr>
<tr>
<td>Net income</td>
<td>$12,000</td>
</tr>
</tbody>
</table>

Required:

a. Contribution margin per unit is $13 per unit
b. If sales are doubled to $240,000, total variable costs will equal $136,000
c. If sales are doubled to $240,000, total fixed costs will equal $40,000
d. If 10 more units are sold, profits will increase by $130
e. Compute how many units must be sold to break even. 3,077 units
f. Compute how many units must be sold to achieve profits of $20,000. 4,616 units

Answer:

a. Contribution margin per unit is $30 - $17 = $13
b. $68,000 × 2 = $136,000
c. $40,000
d. Contribution margin of $13 × 10 units = $130
e. Fixed costs of $40,000 / Contribution margin per unit $13 = 3,077 units
f. (Fixed costs of $40,000 + Profits $20,000) / CM per unit $13 = 4,616 units

Diff: 2
Terms: cost-volume-profit (CVP) analysis
Objective: 1, 2
AACSB: Analytical skills
43) Black Pearl, Inc., sells a single product. The company's most recent income statement is given below.

<table>
<thead>
<tr>
<th>Describe</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$50,000</td>
</tr>
<tr>
<td>Less variable expenses</td>
<td>$(30,000)</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$20,000</td>
</tr>
<tr>
<td>Less fixed expenses</td>
<td>$(12,500)</td>
</tr>
<tr>
<td>Net income</td>
<td>$ 7,500</td>
</tr>
</tbody>
</table>

**Required:**

a. Contribution margin ratio is ________ %

b. Breakeven point in total sales dollars is $ ________

c. To achieve $40,000 in net income, sales must total $ ________

d. If sales increase by $50,000, net income will increase by $ ________

**Answer:**

a. Contribution margin ratio is $20,000 / $50,000 = 40%
b. Fixed costs $12,500 / 0.40 CM% = $31,250 in sales
c. [Fixed costs $12,500 + Net income $40,000] / 0.40 CM% = $131,250 in sales
d. $50,000 × 0.40 CM% = $20,000 increase in net income

Diff: 2
Terms: cost-volume-profit (CVP) analysis
Objective: 1, 2
AACSB: Analytical skills
44) Berhannan's Cellular sells phones for $100. The unit variable cost per phone is $50 plus a selling commission of 10%. Fixed manufacturing costs total $1,250 per month, while fixed selling and administrative costs total $2,500.

**Required:**

a. What is the contribution margin per phone?

b. What is the breakeven point in phones?

c. How many phones must be sold to earn pretax income of $7,500?

**Answer:**

a. \[ CM \text{ per phone} = \$100 - \$50 - 0.1(\$100) = \$40 \]

b. \[ N = \text{Breakeven in phones} \]

\[ \$100N - \$50N - \$10N - \$1,250 - \$2,500 = 0 \]

\[ 40N - 3,750 = 0 \]

\[ N = \frac{3,750}{40} = 93.75 \text{ phones} \]

Breakeven is 94 phones

b. \[ N = \text{Phones to be sold} \]

\[ \$100N - \$50N - \$10N - \$1,250 - \$2,500 = \$7,500 \]

\[ 40N = 11,250 \]

\[ N = \frac{11,250}{40} = 281.25 \text{ phones} \]

282 phones must be sold

**45) What is meant by the term breakeven point? Why should a manager be concerned about the breakeven point?**

**Answer:** The breakeven point is the level of production and sales at which total revenues equal total costs. Managers should be concerned about the breakeven point because it helps determine when a business venture will be profitable. Breakeven point shows a company how far sales can decline before a net loss will be incurred. It helps to assess the risk of loss.

**Diff: 2**

**Terms:** breakeven point (BEP)

**Objective:** 2

**AACSB:** Reflective thinking
Objective 3.3

Answer the following questions using the information below:

Stephanie's Bridal Shoppe sells wedding dresses. The average selling price of each dress is $1,000, variable costs are $400, and fixed costs are $90,000.

1) How many dresses must the Bridal Shoppe sell to yield after-tax net income of $18,000, assuming the tax rate is 40%?
   A) 200 dresses
   B) 170 dresses
   C) 150 dresses
   D) 145 dresses
   Answer: A
   Explanation: A) $1,000N - $400N - $90,000 = $18,000 / (1 - 0.4); $600N - $90,000 = $30,000; N = 200 units
   Diff: 3
   Terms: net income
   Objective: 3
   AACSB: Analytical skills

Answer the following questions using the information below:

Assume the following cost information for Fernandez Company:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>$120 per unit</td>
</tr>
<tr>
<td>Variable costs</td>
<td>$80 per unit</td>
</tr>
<tr>
<td>Total fixed costs</td>
<td>$80,000</td>
</tr>
<tr>
<td>Tax rate</td>
<td>40%</td>
</tr>
</tbody>
</table>

2) What minimum volume of sales dollars is required to earn an aftertax net income of $30,000?
   A) $465,000
   B) $330,000
   C) $390,000
   D) $165,000
   Answer: C
   Explanation: C) \([80,000 + (30,000/0.6)] / \[(120 - 80) / 120\] = 390,000
   Diff: 3
   Terms: net income
   Objective: 3
   AACSB: Analytical skills
3) What is the number of units that must be sold to earn an after-tax net income of $42,000?
A) 3,750 units  
B) 4,625 units  
C) 3,050 units  
D) 1,875 units  
Answer: A  
Explanation: A) \[ \$80,000 + (\frac{\$42,000}{0.6}) \] / (\$120 - \$80) = 3,750 units  
Diff: 3  
Terms: net income  
Objective: 3  
AACSB: Analytical skills

4) In CVP analysis, focusing on target net income rather than operating income:  
A) will increase the breakeven point  
B) will decrease the breakeven point  
C) will not change the breakeven point  
D) does not allow calculation of breakeven point  
Answer: C  
Diff: 2  
Terms: net income  
Objective: 3  
AACSB: Reflective thinking

5) To determine the effect of income tax on a decision, managers should evaluate:  
A) target operating income  
B) contribution margin  
C) target net income  
D) selling price  
Answer: C  
Diff: 1  
Terms: net income  
Objective: 3  
AACSB: Ethical reasoning

6) If the tax rate is \( t \), it is possible to calculate planned operating income by:  
A) dividing net income by \( t \)  
B) dividing net income by \( 1 - t \)  
C) multiplying net income by \( t \)  
D) multiplying net income by \( 1 - t \)  
Answer: B  
Diff: 2  
Terms: net income  
Objective: 3  
AACSB: Reflective thinking
7) If Bel Air Realtor plans an operating income of $210,000 and the tax rate is 30%, then Bel Air's planned net income should be:
   A) $63,000
   B) $147,000
   C) $273,000
   D) $357,000
   Answer: B
   Explanation: B) $210,000 - ($210,000 × .3) = $147,000
   Diff: 2
   Terms: net income
   Objective: 3
   AACSB: Analytical skills

8) The Marietta Company has fixed costs of $40,000 and variable costs are 75% of the selling price. To realize profits of $10,000 from sales of 50,000 units, the selling price per unit:
   A) must be $1.00
   B) must be $1.33
   C) must be $4.00
   D) is indeterminable
   Answer: C
   Explanation: C) ($40,000 + $10,000) / .25 = $200,000 in sales / 50,000 units = $4 per unit
   Diff: 3
   Terms: cost-volume-profit (CVP) analysis
   Objective: 3
   AACSB: Analytical skills

9) An increase in the tax rate will increase the breakeven point.
   Answer: FALSE
   Explanation: A change in the tax rate will not change the breakeven point.
   Diff: 2
   Terms: net income
   Objective: 3
   AACSB: Analytical skills

10) When making net income evaluations, CVP calculations for target income must be stated in terms of target operating income instead of target net income.
    Answer: FALSE
    Explanation: Target net income must be used as income taxes will reduce the operating income.
    Diff: 2
    Terms: net income
    Objective: 3
    AACSB: Reflective thinking

11) If operating income is $40,000 and the income tax rate is 30%, then net income will be $28,000.
    Answer: TRUE
    Diff: 1
    Terms: net income
    Objective: 3
    AACSB: Analytical skills
12) If planned net income is $30,000 and the tax rate is 30%, then planned operating income would be $39,000.
Answer: FALSE
Explanation: If planned net income is $30,000 and the tax rate is 30%, then planned operating income would be $42,857, [$30,000 / (1.0 - .3) = $42,857].
Diff: 2
Terms: net income
Objective: 3
AACSB: Analytical skills

13) The Holiday Card Company, a producer of specialty cards, has asked you to complete several calculations based upon the following information:

<table>
<thead>
<tr>
<th>Income tax rate</th>
<th>30%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price per unit</td>
<td>$6.60</td>
</tr>
<tr>
<td>Variable cost per unit</td>
<td>$5.28</td>
</tr>
<tr>
<td>Total fixed costs</td>
<td>$46,200.00</td>
</tr>
</tbody>
</table>

**Required:**

a. What is the breakeven point in cards?
b. What sales volume is needed to earn an after-tax net income of $13,028.40?  
c. How many cards must be sold to earn an after-tax net income of $18,480?

**Answer:**

a. $46,200/($6.60 - $5.28) = 35,000 units

b. $13,028.40/0.70 = $18,612
   $18,612 + $46,200 = $64,812
   $64,812/1.32 = 49,100 units
   49,100 units × $6.60 = $324,060

   c. $18,480/0.70 = $26,400
      $26,400 + $46,200 = $72,600
      $72,600/1.32 = 55,000 units

Diff: 2
Terms: breakeven point (BEP), net income
Objective: 2, 3
AACSB: Analytical skills
14) James Corporation gathered the following information:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable costs</td>
<td>$550,000</td>
</tr>
<tr>
<td>Income tax rate</td>
<td>40%</td>
</tr>
<tr>
<td>Contribution-margin ratio</td>
<td>30%</td>
</tr>
</tbody>
</table>

**Required:**

a. Compute total fixed costs assuming a breakeven volume in dollars of $2,000,000.
b. Compute sales volume in dollars to produce an after-tax net income of $150,000.

**Answer:**

a. $2,000,000 × 0.30 = $600,000

b. \( \frac{($600,000 + ($150,000 \times (1-.40)))}{.30} = \frac{$2,833,333.33}{.30} \) or $2,833,334 units rounding up to the next whole unit.

**Diff:** 3  
**Terms:** cost-volume-profit (CVP) analysis, net income  
**Objective:** 2, 3  
**AACSB:** Analytical skills

15) What effect, and why, would an increase in the tax rate have on a company's breakeven point?

**Answer:** An increase in the tax rate would have no effect on the breakeven point. At the breakeven point, before-tax net income would be zero, so after-tax net income would also be zero regardless of the tax rate.

**Diff:** 2  
**Terms:** breakeven point (BEP), net income  
**Objective:** 3  
**AACSB:** Reflective thinking

Objective 3.4

1) Assume only the specified parameters change in a cost-volume-profit analysis. If the contribution margin increases by $6 per unit, then operating profits will:

A) also increase by $6 per unit  
B) increase by less than $6 per unit  
C) decrease by $6 per unit  
D) be indeterminable

**Answer:** A

**Diff:** 2  
**Terms:** cost-volume-profit (CVP) analysis  
**Objective:** 4  
**AACSB:** Analytical skills
2) The breakeven point decreases if:
A) the variable cost per unit increases
B) total fixed costs decrease
C) the contribution margin per unit decreases
D) the selling price per unit decreases
Answer: B
Diff: 3
Terms: breakeven point (BEP)
Objective: 4
AACSB: Reflective thinking

3) (CPA adapted, November 1992) The strategy most likely to reduce the breakeven point would be to:
A) increase both the fixed costs and the contribution margin
B) decrease both the fixed costs and the contribution margin
C) decrease the fixed costs and increase the contribution margin
D) increase the fixed costs and decrease the contribution margin
Answer: C
Diff: 3
Terms: breakeven point (BEP)
Objective: 4
AACSB: Reflective thinking

4) Assume only the specified parameters change in a CVP analysis. The contribution margin percentage increases when:
A) total fixed costs increase
B) total fixed costs decrease
C) variable costs per unit increase
D) variable costs per unit decrease
Answer: D
Diff: 3
Terms: contribution margin percentage
Objective: 4
AACSB: Reflective thinking

5) Which of the following will increase a company's breakeven point?
A) increasing variable cost per unit
B) increasing contribution margin per unit
C) reducing its total fixed costs
D) increasing the selling price per unit
Answer: A
Diff: 3
Terms: breakeven point (BEP)
Objective: 4
AACSB: Reflective thinking
6) Assume there is a reduction in the selling price and all other CVP parameters remain constant. This change will:
   A) increase contribution margin  
   B) reduce fixed costs  
   C) increase variable costs  
   D) reduce operating income  
   Answer: D  
   Diff: 3  
   Terms: cost-volume-profit (CVP) analysis  
   Objective: 4  
   AACSB: Reflective thinking

7) Assume there is an increase in advertising expenditures and all other CVP parameters remain constant. This change will:
   A) reduce operating income  
   B) reduce contribution margin  
   C) increase variable costs  
   D) increase selling price  
   Answer: A  
   Diff: 3  
   Terms: cost-volume-profit (CVP) analysis  
   Objective: 4  
   AACSB: Analytical skills

8) Bassman Company operates on a contribution margin of 30% and currently has fixed costs of $400,000. Next year, sales are projected to be $2,000,000. An advertising campaign is being evaluated that costs an additional $60,000. How much would sales have to increase to justify the additional expenditure?
   A) $120,000  
   B) $180,000  
   C) $200,000  
   D) $600,000  
   Answer: C  
   Explanation: C) $60,000 / .3 = $200,000  
   Diff: 2  
   Terms: cost-volume-profit (CVP) analysis  
   Objective: 4  
   AACSB: Analytical skills
Answer the following questions using the information below:

Martha Manufacturing produces a single product that sells for $80. Variable costs per unit equal $32. The company expects total fixed costs to be $72,000 for the next month at the projected sales level of 2,000 units. In an attempt to improve performance, management is considering a number of alternative actions. Each situation is to be evaluated separately.

9) Suppose management believes that a $16,000 increase in the monthly advertising expense will result in a considerable increase in sales. Sales must increase by how much to justify this additional expenditure?
   A) 200 units
   B) 334 units
   C) 500 units
   D) None of these answers are correct.
   Answer:  B
   Explanation:  B) $80X - $32X - $16,000 = 0; X = 334 units to cover the expenditures
   Diff: 2
   Terms:  cost-volume-profit (CVP) analysis
   Objective:  4
   AACSB:  Analytical skills

10) Suppose that management believes that a 10% reduction in the selling price will result in a 10% increase in sales. If this proposed reduction in selling price is implemented:
   A) operating income will decrease by $8,000
   B) operating income will increase by $8,000
   C) operating income will decrease by $16,000
   D) operating income will increase by $16,000
   Answer:  A
   Explanation:
   A) $80 \times 10\% = $8 \times 2,000 \text{ units} = \quad ($16,000)
   2,000 \text{ units} \times 10\% = 200 \text{ units} \times ($72 - $32) = \quad 8,000
   \text{Change in operating income} = \quad ($8,000)
   Diff: 3
   Terms:  cost-volume-profit (CVP) analysis
   Objective:  4
   AACSB:  Analytical skills
Answer the following questions using the information below:

Bush Manufacturing produces a single product that sells for $100. Variable costs per unit equal $25. The company expects total fixed costs to be $60,000 for the next month at the projected sales level of 1,000 units. In an attempt to improve performance, management is considering a number of alternative actions. Each situation is to be evaluated separately.

11) Suppose that management believes that a $24,000 increase in the monthly advertising expense will result in a considerable increase in sales. Sales must increase by how much to justify this additional expenditure?

A) 320 units
B) 1,120 units
C) 240 units
D) None of these answers are correct.

Answer: A

Explanation: 
A) $24,000 / ($100 - $25) = 320 units to cover the expenditures

Diff: 2

Terms: cost-volume-profit (CVP) analysis

Objective: 4

AACSB: Analytical skills

12) Suppose that management believes that a 20% reduction in the selling price will result in a 20% increase in sales. If this proposed reduction in selling price is implemented:

A) operating income will decrease by $9,000
B) operating income will increase by $9,000
C) operating income will decrease by $20,000
D) operating income will increase by $15,000

Answer: A

Explanation: 
A) Original contribution margin per unit $75 x 1,000 units = $75,000 - $60,000 fixed costs = Operating Income $15,000
$100 - 20% = $80 new sales price per unit
$80 - $25 = $55 new contribution margin per unit
1,000 units + 20% increase in sales = 1,200 units
$55 x 1,200 units = $66,000 - $60,000 fixed costs = $6,000 new operating income
Change in operating income ($9,000)

Diff: 3

Terms: cost-volume-profit (CVP) analysis

Objective: 4

AACSB: Analytical skills

13) If contribution margin decreases by $1 per unit, then operating profits will increase by $1 per unit.

Answer: FALSE

Explanation: If contribution margin decreases by $1 per unit, then operating profits will decrease by $1 per unit.

Diff: 2

Terms: contribution margin per unit

Objective: 4

AACSB: Reflective thinking
14) If variable costs per unit increase, then the breakeven point will decrease. 
Answer: FALSE  
Explanation: If variable costs per unit increase, then the breakeven point will also increase.  
Terms: breakeven point (BEP)  
Objective: 4  
AACSB: Reflective thinking 

15) A planned increase in advertising would be considered an increase in fixed costs in CVP analysis.  
Answer: TRUE  
Terms: cost-volume-profit (CVP) analysis  
Objective: 4  
AACSB: Reflective thinking 

16) A planned decrease in selling price would be expected to cause an increase in the quantity sold.  
Answer: TRUE  
Terms: cost-volume-profit (CVP) analysis  
Objective: 4  
AACSB: Reflective thinking 

17) In 2011, Grant Company has sales of $800,000, variable costs of $200,000, and fixed costs of $300,000. In 2012, the company expects annual property taxes to decrease by $15,000. 

Required: 
a. Calculate operating income and the breakeven point for 2011. 
b. Calculate the breakeven point for 2012.  
Answer:  
a. In 2011, operating income is $800,000 sales revenue - $200,000 variable costs - $300,000 fixed costs = $300,000.  
   The breakeven point for 2011 is $400,000 in total sales dollars.  
   $600,000 CM / $800,000 sales revenue = 0.75 CM ratio. $300,000 total fixed costs / 0.75 CM ratio = $400,000 in total sales to break even.  
b. The breakeven point for 2012 is $380,000 in total sales dollars.  
   $300,000 fixed costs - $15,000 reduction in property taxes = $285,000 estimated fixed costs for 2012. $285,000 total fixed costs / 75% CM ratio = $380,000 in total sales to break even.  

Diff: 2  
Terms: breakeven point (BEP)  
Objective: 1, 4  
AACSB: Analytical skills
18) Furniture, Inc., sells lamps for $30. The unit variable cost per lamp is $22. Fixed costs total $9,600.

**Required:**

a. What is the contribution margin per lamp?
b. What is the breakeven point in lamps?
c. How many lamps must be sold to earn a pretax income of $8,000?
d. What is the margin of safety, assuming 1,500 lamps are sold?

**Answer:**

a. Contribution margin per lamp = $30 - $22 = $8

b. \[ N = \text{Breakeven point in lamps} \]
   \[ 30N - 22N - 9,600 = 0 \]
   \[ 8N - 9,600 = 0 \]
   \[ N = \frac{9,600}{8} = 1,200 \text{ lamps} \]

c. \[ N = \text{Target sales in lamps} \]
   \[ 30N - 22N - 9,600 - 8,000 = 0 \]
   \[ 8N - 17,600 = 0 \]
   \[ N = \frac{17,600}{8} = 2,200 \text{ lamps} \]

d. Margin of safety = Sales - Breakeven sales
   \[ = (30.00 \times 1,500) - 36,000 = 9,000 \]

**Diff:** 3

**Terms:** contribution margin per unit, margin of safety, break-even point (BEP)

**Objective:** 2, 4

**AACSB:** Analytical skills
19) Tom's Tire Tower, Inc., sells tires for $110. The unit variable cost per tire is $85. Fixed costs total $475,000.

**Required:**

a. What is the contribution margin per tire?

b. What is the breakeven point in tires?

c. How many tires must be sold to earn a pretax income of $450,000?

d. What is the margin of safety, assuming 33,000 tires are sold?

**Answer:**

a. Contribution margin per tire = $110 - $85 = $25

b. N = Breakeven point in tires

\[
\begin{align*}
$110N - $85N - $475,000 &= 0 \\
$25N &= $475,000 \\
N &= $475,000/$25 = 19,000 	ext{ tires}
\end{align*}
\]

c. N = Target sales in tires

\[
\begin{align*}
$110N - $85N - $450,000 - $475,000 &= 0 \\
$25N - $925,000 &= 0 \\
N &= $925,000/$25 = 37,000 	ext{ tires}
\end{align*}
\]

d. Margin of safety = Sales - Breakeven sales

\[
($110 \times 33,000) - ($110 \times 19,000) = $1,540,000
\]

Diff: 3

Terms: contribution margin per unit, margin of safety, breakeven point (BEP)

Objective: 2, 4

AACSB: Analytical skills

Objective 3.5

1) ________ is the process of varying key estimates to identify those estimates that are the most critical to a decision.

A) The graph method

B) A sensitivity analysis

C) The degree of operating leverage

D) Sales mix

Answer: B

Diff: 1

Terms: sensitivity analysis

Objective: 5

AACSB: Reflective thinking
2) The margin of safety is the difference between:
   A) budgeted expenses and breakeven expenses
   B) budgeted revenues and breakeven revenues
   C) actual operating income and budgeted operating income
   D) actual contribution margin and budgeted contribution margin
   Answer: B
   Diff: 1
   Terms: margin of safety
   Objective: 5
   AACSB: Reflective thinking

Answer the following questions using the information below:

Dr. Charles Hunter, MD, performs a certain outpatient procedure for $1,000. His fixed costs are $20,000, while his variable costs are $500 per procedure. Dr. Hunter currently plans to perform 200 procedures this month.

3) What is the margin of safety assuming 100 procedures are budgeted?
   A) $40,000 or 40 times
   B) $50,000 or 50 times
   C) $60,000 or 60 times
   D) $100,000 or 100 times
   Answer: C
   Explanation:
   C) Breakeven in number of procedures = $20,000 / ($1,000 - $500) = 40 times
      Actual sales  100 times × $1,000 = $100,000
      Breakeven sales  40 times × $1,000 =  $40,000
      Margin of safety  60 times  $60,000
   Diff: 3
   Terms: margin of safety
   Objective: 5
   AACSB: Analytical skills

Answer the following questions using the information below:

Nancy's Niche sells a single product. 8,000 units were sold resulting in $80,000 of sales revenue, $20,000 of variable costs, and $10,000 of fixed costs.

4) If variable costs decrease by $1 per unit, the new breakeven point is:
   A) 1,539 units.
   B) 492 units.
   C) $11,765 in total sales dollars.
   D) None of these answers are correct.
   Answer: C
   Explanation: C) [$10 - ($2.50 - $1.00)] / $10 = 85%; $10,000 / 0.85 = $11,765
   Diff: 3
   Terms: breakeven point (BEP)
   Objective: 5
   AACSB: Analytical skills
5) If a change is made in one parameter of CVP analysis, it is an example of:
A) sensitivity analysis
B) incremental budgeting
C) operating leverage
D) multiple cost drivers
Answer:  A
Diff:  1
Terms:  sensitivity analysis
Objective:  5
AACSB:  Communication

6) Sensitivity analysis is a "what-if" technique that managers use to examine how a result will change if the originally predicted data are NOT achieved or if an underlying assumption changes.
Answer:  TRUE
Diff:  1
Terms:  sensitivity analysis
Objective:  5
AACSB:  Reflective thinking

7) Margin of safety measures the difference between budgeted revenues and breakeven revenues.
Answer:  TRUE
Diff:  1
Terms:  margin of safety
Objective:  5
AACSB:  Reflective thinking

8) If a company's breakeven revenue is $1,000 and its budgeted revenue is $1,250, then its margin of safety percentage is 25%.
Answer:  FALSE
Explanation:  The margin of safety percentage is 20% as the denominator of the ratio is the budgeted level and not the breakeven level.
Diff:  2
Terms:  margin of safety
Objective:  5
AACSB:  Analytical skills

9) Sensitivity analysis helps to evaluate the risk associated with decisions.
Answer:  TRUE
Diff:  1
Terms:  sensitivity analysis
Objective:  5
AACSB:  Ethical reasoning
10) Alex Miller, Inc., sells car batteries to service stations for an average of $30 each. The variable cost of each battery is $20 and monthly fixed manufacturing costs total $10,000. Other monthly fixed costs of the company total $8,000.

**Required:**

a. What is the breakeven point in batteries?

b. What is the margin of safety, assuming sales total $60,000?

c. What is the breakeven level in batteries, assuming variable costs increase by 20%?

d. What is the breakeven level in batteries, assuming the selling price goes up by 10%, fixed manufacturing costs decline by 10%, and other fixed costs decline by $100?

**Answer:**

a. \[ N = \text{Breakeven units} \]
\[ \$30N - \$20N - \$10,000 - \$8,000 = 0 \]
\[ \$10N - \$18,000 = 0 \]
\[ N = \frac{\$18,000}{\$10} = 1,800 \text{ batteries} \]

b. Margin of safety = $60,000 - ($30 \times 1,800) = $6,000

c. \[ N = \text{Breakeven units} \]
\[ \$30N - \$24N - \$10,000 - \$8,000 = 0 \]
\[ \$6N - \$18,000 = 0 \]
\[ N = \frac{\$18,000}{\$6} = 3,000 \text{ batteries} \]

d. \[ N = \text{Breakeven units} \]
\[ \$33N - \$20N - \$9,000 - \$7,900 = 0 \]
\[ \$13N - \$16,900 = 0 \]
\[ N = \frac{\$16,900}{\$13} = 1,300 \text{ batteries} \]

Diff: 2

Terms: cost-volume-profit (CVP) analysis, breakeven point (BEP), margin of safety

Objective: 2, 4, 5

AACSB: Analytical skills

11) Explain when a manager would use cost-volume-profit analysis and sensitivity analysis.

**Answer:** Cost-volume-profit analysis is helpful for evaluating the profit impact of management decisions that affect production and sales volume.

Sensitivity analysis is helpful for identifying those estimates most critical for a decision.

Diff: 2

Terms: cost-volume-profit (CVP) analysis, sensitivity analysis

Objective: 1, 5

AACSB: Reflective thinking
Objective 3.6

Answer the following questions using the information below:

Southwestern College is planning to hold a fundraising banquet at one of the local country clubs. It has two options for the banquet:

**OPTION 1:**  *Crestview Country Club*
- a. Fixed rental cost of $1,000
- b. $12 per person for food

**OPTION 2:**  *Tallgrass Country Club*
- a. Fixed rental cost of $3,000
- b. A caterer who charges $8.00 per person for food

Southwestern College has budgeted $1,800 for administrative and marketing expenses. It plans to hire a band which will cost another $800. Tickets are expected to be $30 per person. Local business supporters will donate any other items required for the event.

1) Which option provides the least amount of risk?
A) Option one  
B) Option two  
C) Both options provide the same amount of risk.  
D) Neither option has risks.  
Answer:  A  
Diff:  1  
Terms:  operating leverage  
Objective:  6  
AACSB:  Analytical skills

2) Which option has the lowest breakeven point?
A) Option one  
B) Option two  
C) Both options have the same breakeven point.  
D) The lowest breakeven point cannot be determined.  
Answer:  A  
Explanation:  A) Option 1: $30X - $12X - $1,000 - $1,800 - $800 = 0; X = $200  
Option 2: $30X - $8X - $3,000 - $1,800 - $800 = 0; X = $255  
Diff:  2  
Terms:  operating leverage  
Objective:  6  
AACSB:  Analytical skills
3) Which option provides the greatest operating income if 600 people attend?
A) Option one
B) Option two
C) Operating incomes are identical.
D) Operating income is indeterminable.
Answer: B
Explanation: B) Option 1: $18 \times 600 - $3,600 = $7,200; Option 2: $22 \times 600 - $5,600 = $7,600
Diff: 2
Terms: operating leverage
Objective: 6
AACSB: Analytical skills

4) Which option provides the greatest degree of operating leverage if 600 people attend?
A) Option one
B) Option two
C) Both options provide equal degrees of operating leverage.
D) Operating leverage is indeterminable.
Answer: B
Explanation: B) Option 1: $18 \times 600 / $7,200 = 1.50; Option 2: $22 \times 600 / $7,600 = 1.74
Diff: 3
Terms: operating leverage
Objective: 6
AACSB: Analytical skills

5) Option 1: Fixed costs of $10,000 and a breakeven point of 500 units.
Option 2: Fixed costs of $20,000 and a breakeven point of 700 units.
Which option should you choose if you are expecting to produce 600 units?
A) Option one
B) Option two
C) Both options are equally desirable.
D) The best option is indeterminable.
Answer: A
Explanation: A) Option 1 will result in operating income while Option 2 will result in an operating loss.
Diff: 2
Terms: operating leverage
Objective: 6
AACSB: Analytical skills
6) Mrs. Tannenbaum is going to sell Christmas tree lights for $40 a box. The lights cost Mrs. Tannenbaum $10 a box and any unsold lights can be returned for a full refund. She is planning to rent a booth at the upcoming Happy Holidays Convention, which offers three options:

1. paying a fixed fee of $3,000, or
2. paying a $1,000 fee plus 10% of revenues made at the convention, or
3. paying 25% of revenues made at the convention.

Which of the following statements is FALSE?

A) Her decision will determine the risk she faces.
B) Contribution margin will vary depending upon the option chosen.
C) One of the options will allow Mrs. Tannenbaum to break even, even if she doesn't sell any lights.
D) Operating income will be the greatest for Option 3.

Answer: D

Diff: 3
Terms: operating leverage
Objective: 6
AACSB: Analytical skills

7) In a company with low operating leverage:

A) fixed costs are high and variable costs are low
B) large changes in sales volume result in small changes in net income
C) there is a higher possibility of net loss than a higher-leveraged firm
D) less risk is assumed than in a highly leveraged firm

Answer: D

Diff: 3
Terms: operating leverage
Objective: 6
AACSB: Reflective thinking

8) If the contribution margin ratio is 0.40, targeted operating income is $80,000, and targeted sales volume in dollars is $500,000, then total fixed costs are:

A) $80,000
B) $100,000
C) $120,000
D) $200,000

Answer: C

Explanation: (X + $80,000)/0.40 = $500,000; X = $120,000

Diff: 3
Terms: contribution margin ratio
Objective: 6
AACSB: Analytical skills
9) If the contribution margin ratio is 0.40, targeted operating income is $50,000, and fixed costs are $75,000, then sales volume in dollars is:
   A) $250,000  
   B) $312,500  
   C) $275,000  
   D) $350,000  
   Answer:  B  
   Explanation:  B) \( X = (50,000 + 75,000)/0.4; \ X = \$312,500 \)  
   Diff: 3  
   Terms:  contribution margin ratio  
   Objective:  6  
   AACSB:  Analytical skills

10) If the contribution margin ratio is 0.25, targeted operating income is $25,000, and targeted sales volume in dollars is $200,000, then total fixed costs are:
   A) $50,000  
   B) $100,000  
   C) $75,000  
   D) $25,000  
   Answer:  D  
   Explanation:  D) \( (X + 25,000)/0.25 = \$200,000; \ X = 25,000 \)  
   Diff: 3  
   Terms:  contribution margin ratio  
   Objective:  6  
   AACSB:  Analytical skills

11) Fixed costs:
   A) are considered variable costs over the long run  
   B) provide less operating leverage  
   C) reduce the risk of loss  
   D) are graphed as a steeply sloped line  
   Answer:  A  
   Diff: 2  
   Terms:  operating leverage  
   Objective:  6  
   AACSB:  Reflective thinking

12) When a greater proportion of costs are fixed costs, then:
   A) a small increase in sales results in a small decrease in operating income  
   B) when demand is low the risk of loss is high  
   C) when demand is high the breakeven point is increased  
   D) a decrease in sales reduces the cost per unit  
   Answer:  B  
   Diff: 2  
   Terms:  operating leverage  
   Objective:  6  
   AACSB:  Reflective thinking
13) Companies with a greater proportion of fixed costs have a greater risk of loss than companies with a greater proportion of variable costs.
Answer: TRUE
Diff: 2
Terms: operating leverage
Objective: 6
AACSB: Reflective thinking

14) The degree of operating leverage at a specific level of sales helps the managers calculate the effect that potential changes in sales will have on operating income.
Answer: TRUE
Diff: 1
Terms: operating leverage
Objective: 6
AACSB: Reflective thinking

15) If a company increases fixed costs, then the breakeven point will be lower.
Answer: FALSE
Explanation: If a company increases fixed costs, then the breakeven point will be higher.
Diff: 3
Terms: breakeven point (BEP)
Objective: 6
AACSB: Reflective thinking

16) Companies that are substituting fixed costs for variable costs receive a greater per unit return above the breakeven point.
Answer: TRUE
Diff: 3
Terms: operating leverage
Objective: 6
AACSB: Reflective thinking

17) A company with a low degree of operating leverage is at greater risk during downturns in the economy.
Answer: FALSE
Explanation: A company with a low degree of operating leverage is at lesser risk during downturns in the economy.
Diff: 3
Terms: operating leverage
Objective: 6
AACSB: Analytical skills

18) Whether the purchase cost of a machine is treated as fixed or variable depends heavily on the time horizon being considered.
Answer: TRUE
Diff: 1
Terms: operating leverage
Objective: 6
AACSB: Reflective thinking
19) If a company has a degree of operating leverage of 4.0, that means a 10% increase in sales will result in a 40% increase in variable costs.
Answer: FALSE
Explanation: If a company has a degree of operating leverage of 2.0, that means a 20% increase in sales will result in a 40% increase in operating income.
Diff: 3
Terms: operating leverage
Objective: 6
AACSB: Analytical skills

20) When a company has at least some fixed costs, the degree of operating leverage is different at different levels of sales.
Answer: TRUE
Diff: 2
Terms: operating leverage
Objective: 6
AACSB: Reflective thinking

21) Query Company sells pillows for $25.00 each. The manufacturing cost, all variable, is $10 per pillow. The company is planning on renting an exhibition booth for both display and selling purposes at the annual crafts and art convention. The convention coordinator allows three options for each participating company. They are:
1. paying a fixed booth fee of $5,010, or
2. paying an $4,000 fee plus 10% of revenue made at the convention, or
3. paying 20% of revenue made at the convention.

Required:

a. Compute the breakeven sales in pillows of each option.

b. Which option should Query Company choose, assuming sales are expected to be 800 pillows?

Answer:

a. Option 1   \[ N = \text{Breakeven in pillows} \]
\[ 25N - 10N - 5,010 = 0 \]
\[ 15N - 5,010 = 0 \]
\[ N = 5,010/15 = 334 \text{ pillows} \]

Option 2   \[ N = \text{Breakeven in pillows} \]
\[ 25N - 10N - 0.10(25N) - 4,000 = 0 \]
\[ 12.5N - 4,000 = 0 \]
\[ N = 4,000/12.5 = 320 \text{ pillows} \]

Option 3   \[ N = \text{Breakeven in pillows} \]
\[ 25N - 10N - 0.20(25N) = 0 \]
\[ 10N - 0 = 0 \]
\[ N = 0/10 = 0 \text{ pillows} \]

b. Option 1 profit for 800 pillows = $15 \times 800 - 5,010 = $6,990
Option 2 profit for 800 pillows = $12.5 \times 800 - 4,000 = $6,000
Option 3 profit for 800 pillows = $10 \times 800 = $8,000
Option 3 is the best choice.
22) Auto Tires has been in the tire business for four years. It rents a building but owns all of its equipment. All employees are paid a fixed salary except for the busy season (April-June), when temporary help is hired by the hour. Utilities and other operating charges remain fairly constant during each month except those in the busy season.

Selling prices per tire average $75 except during the busy season. Because a large number of customers buy tires prior to winter, discounts run above average during the busy season. A 15% discount is given when two tires are purchased at one time. During the busy months, selling prices per tire average $60.

The president of Auto Tires is somewhat displeased with the company's management accounting system because the cost behavior patterns displayed by the monthly breakeven charts are inconsistent; the busy months' charts are different from the other months of the year. The president is never sure if the company has a satisfactory margin of safety or if it is just above the breakeven point.

**Required:**

a. What is wrong with the accountant's computations?
b. How can the information be presented in a better format for the president?

**Answer:**

a. The accounting system includes some assumptions about the CVP model that does not hold for Auto Tire. The CVP model requires cost and revenue to be linear. During the busy months, the company has costs and revenues which behave differently than during the other months of the year. The revenue line turns down (less slope) with the average selling price per tire decreasing from $75 to $60. The variable costs line probably turns upward (increasing slope) with the additional hourly workers being added to the work force.

b. The accountant may want to present two sets of information regarding the revenue and cost behaviors of the company: one for the busy season and one for the other months of the year. It would show that while the breakeven point actually increases during the busy months (a negative), the marginal income increases because of increased sales (a positive).
23) Dolph and Evan started the DE Restaurant in 20X3. They rented a building, bought equipment, and hired two employees to work full time at a fixed monthly salary. Utilities and other operating charges remain fairly constant during each month.

During the past two years, the business has grown with average sales increasing 1% a month. This situation pleases both Dolph and Evan, but they do not understand how sales can grow by 1% a month while profits are increasing at an even faster pace. They are afraid that one day they will wake up to increasing sales but decreasing profits.

**Required:**
Explain why the profits have increased at a faster rate than sales. Use the terms variable costs and fixed costs in your response.

**Answer:** The fixed cost per meal served is decreasing with increased volumes, while the contribution margin per meal served remains constant. Apparently, most of the restaurant's expenses are fixed. Therefore, as sales pass the breakeven point the profit will increase even faster because the fixed expenses have already been covered. This allows sales to cover only variable expenses before contributing to the profit margin, thereby causing it to increase at a faster rate.

**Diff:** 2
**Terms:** operating leverage, cost-volume-profit (CVP) analysis
**Objective:** 2, 6
**AACSB:** Reflective thinking

24) Freddie's company has mostly fixed costs and Valerie's company has mostly variable costs. Which company has the greatest risk of a net loss? Explain why

**Answer:** Freddie's company has the greatest risk of net loss because more units are required to reach breakeven point than for Valerie.

**Diff:** 2
**Terms:** operating leverage
**Objective:** 6
**AACSB:** Reflective thinking

25) Suppose a company decided to automate a production line. Explain what effects this would have on a company's cost structure using CVP terminology. Could these changes have any possible negative effect on the firm?

**Answer:** An automated production line would increase fixed costs through extra depreciation on the new machinery and also decrease variable costs due to the elimination of direct labor as a result of automation. This would increase the breakeven point. This could possibly have a negative effect on the firm if demand for the product produced by this production line is expected to decline in the future. With high fixed costs and low demand, a decline in profits might be more severe due to the presence of unchanging fixed costs as volume drops.

**Diff:** 2
**Terms:** operating leverage
**Objective:** 6
**AACSB:** Reflective thinking
Objective 3.7

Answer the following questions using the information below:

The following information is for Barnett Corporation:

<table>
<thead>
<tr>
<th>Product</th>
<th>Revenue</th>
<th>Variable Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product X</td>
<td>$10.00</td>
<td>$2.50</td>
</tr>
<tr>
<td>Product Y</td>
<td>$15.00</td>
<td>$5.00</td>
</tr>
<tr>
<td>Total fixed costs</td>
<td>$50,000</td>
<td></td>
</tr>
</tbody>
</table>

1) What is the breakeven point assuming the sales mix consists of two units of Product X and one unit of Product Y?
   A) 1,000 units of Y and 2,000 units of X
   B) 1,013 units of Y and 2,025 units of X
   C) 2,013 units of Y and 4,025 units of X
   D) 2,000 units of Y and 4,000 units of X
   Answer: D
   Explanation:
   D) \( N = \) units of product Y; and \( 2N = \) units of product X;
   \[ ($10.00 - $2.50)2N + ($15.00 - $5.00) N - $50,000 = 0 \]
   \[ $25N + $10N = $50,000 \]
   \[ $25N = $50,000 \]
   \[ N = 2,000 \text{ units} \]

   Product Y = 2,000 units; Product X = 4,000 units

Diff: 3
Terms: sales mix
Objective: 7
AACSB: Analytical skills
2) What is the operating income, assuming actual sales total 150,000 units, and the sales mix is two units of Product X and one unit of Product Y?
A) $1,200,000
B) $1,250,000
C) $1,750,000
D) None of these answers are correct.
Answer: A
Explanation:
<table>
<thead>
<tr>
<th>Sales units</th>
<th>Product X</th>
<th>Product Y</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>$1,000,000</td>
<td>$750,000</td>
<td>$1,750,000</td>
</tr>
<tr>
<td>Var. costs</td>
<td>250,000</td>
<td>250,000</td>
<td>500,000</td>
</tr>
<tr>
<td>CM</td>
<td>$750,000</td>
<td>$500,000</td>
<td>$1,250,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td></td>
<td></td>
<td>50,000</td>
</tr>
</tbody>
</table>

\[ \text{Total} = 150,000 \times \text{CM} = 150,000 \times \frac{1,250,000}{500,000} = 1,200,000 \]

Diff: 3
Terms: sales mix
Objective: 7
AACSB: Analytical skills

3) If the sales mix shifts to one unit of Product X and two units of Product Y, then the weighted-average contribution margin will:
A) increase per unit
B) stay the same
C) decrease per unit
D) be indeterminable
Answer: A
Diff: 2
Terms: sales mix
Objective: 7
AACSB: Reflective thinking

4) If the sales mix shifts to one unit of Product X and two units of Product Y, then the breakeven point will:
A) increase
B) stay the same
C) decrease
D) be indeterminable
Answer: C
Diff: 2
Terms: sales mix
Objective: 7
AACSB: Analytical skills
Answer the following questions using the information below:

The following information is for the Jeffries Corporation:

<table>
<thead>
<tr>
<th>Product</th>
<th>Revenue</th>
<th>Variable Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product A</td>
<td>$16.00</td>
<td>$12.00</td>
</tr>
<tr>
<td>Product B</td>
<td>$24.00</td>
<td>$16.00</td>
</tr>
<tr>
<td>Total fixed costs</td>
<td>$75,000</td>
<td></td>
</tr>
</tbody>
</table>

5) What is the breakeven point, assuming the sales mix consists of three units of Product A and one unit of Product B?
   A) 10,000 units of A and 5,000 units of B
   B) 11,250 units of A and 3,750 units of B
   C) 12,000 units of A and 4,000 units of B
   D) 4,000 units of A and 12,000 units of B

Answer: B

Explanation:
B) N = units of product B; and 3N = units of product A;
   ($16.00 - $12.00)3N + ($24.00 - $16.00) N - $75,000 = 0
   $12N + $8N = $75,000
   $20N = $75,000
   N = 3,750 units

Product A = 11,250 units; Product B = 3,750 units

Diff: 3
Terms: sales mix
Objective: 7
AACSB: Analytical skills
6) What is the operating income, assuming actual sales total 25,000 units, and the sales mix is three units of Product A and one unit of Product B?

A) $50,000  
B) $60,000  
C) $75,000  
D) None of these answers are correct.

Answer: A  
Explanation:

<table>
<thead>
<tr>
<th></th>
<th>Product A</th>
<th>Product B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales units</td>
<td>18,750</td>
<td>6,250</td>
<td>25,000</td>
</tr>
<tr>
<td>Revenue</td>
<td>$300,000</td>
<td>$150,000</td>
<td>$450,000</td>
</tr>
<tr>
<td>Var. costs</td>
<td>225,000</td>
<td>100,000</td>
<td>325,000</td>
</tr>
<tr>
<td>CM</td>
<td>$75,000</td>
<td>$50,000</td>
<td>$125,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td></td>
<td></td>
<td>75,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$50,000</td>
</tr>
</tbody>
</table>

Diff: 3  
Terms: sales mix  
Objective: 7  
AACSB: Analytical skills

7) If the sales mix shifts to four units of Product A and one unit of Product B, then the weighted-average contribution margin will:

A) increase per unit  
B) stay the same  
C) decrease per unit  
D) be indeterminable  

Answer: C  
Diff: 2  
Terms: sales mix  
Objective: 7  
AACSB: Analytical skills

8) If the sales mix shifts to four units of Product A and one unit of Product B, then the breakeven point will:

A) increase  
B) stay the same  
C) decrease  
D) be indeterminable  

Answer: A  
Diff: 2  
Terms: sales mix  
Objective: 7  
AACSB: Analytical skills
9) Assuming a constant mix of 3 units of Small for every 1 unit of Large.

<table>
<thead>
<tr>
<th></th>
<th>Small</th>
<th>Large</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$20</td>
<td>$30</td>
<td></td>
</tr>
<tr>
<td>VC</td>
<td>14</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Total fixed costs</td>
<td></td>
<td></td>
<td>$48,000</td>
</tr>
</tbody>
</table>

The breakeven point in units would be:
A) 4,800 units of Small and 1,600 units of Large
B) 1,200 units of Small and 400 units of Large
C) 1,600 units of Small and 4,800 units of Large
D) 400 units of Small and 1,200 units of Large
Answer: A
Explanation:

\[
\begin{array}{c|c|c}
& \text{Small} & \text{Large} \\
\hline
\text{Sales} & $20 & $30 \\
\text{Variable costs} & 14 & 18 \\
\text{Contribution margin} & $6 & $12 \\
\text{Sales mix} & \times 3 & \times 1 \\
\text{Contribution margin per mix} & $18 & $12 \\
\end{array}
\]

Total contribution margin per mix = $18 + $12 = $30

Breakeven point in composite units = $48,000/$30 = 1,600

Small: 1,600 × 3 = 4,800 units
Large: 1,600 × 1 = 1,600 units
Diff: 3
Terms: sales mix
Objective: 7
AACSB: Analytical skills

10) In multiproduct situations, when sales mix shifts toward the product with the lowest contribution margin then:
A) total revenues will increase
B) breakeven quantity will decrease
C) total contribution margin will increase
D) operating income will decrease
Answer: D
Diff: 3
Terms: sales mix
Objective: 7
AACSB: Reflective thinking
11) If a company has a degree of operating leverage of 3.0 and sales increase by 25%, then:
A) total variable costs will increase by 75%  
B) total variable costs will not change  
C) profit will increase by 30%  
D) profit will increase by 75%  
Answer: D  
Explanation: D) 3.0 x 25% = 75%  
Diff: 2  
Terms: operating leverage  
Objective: 7  
AACSB: Analytical skills

12) If a company would like to increase its degree of operating leverage it should:
A) increase its inventories relative to its receivables  
B) increase its receivables relative to its inventories  
C) increase its variable costs relative to its fixed costs  
D) increase its fixed costs relative to its variable costs  
Answer: D  
Diff: 2  
Terms: operating leverage  
Objective: 7  
AACSB: Reflective thinking

13) Passenger-miles are a potential measure of output for the airline industry.  
Answer: TRUE  
Diff: 1  
Terms: cost-volume-profit (CVP) analysis  
Objective: 7  
AACSB: Reflective thinking

14) Pounds of yeast used by a bake shop is a potential measure of output for the bakery industry.  
Answer: FALSE  
Explanation: Loaves of bread or dozens of doughnuts are examples of outputs; yeast is an input that would be part of the variable cost of the product.  
Diff: 1  
Terms: cost-volume-profit (CVP) analysis  
Objective: 7  
AACSB: Analytical skills

15) In multiproduct situations when sales mix shifts toward the product with the lowest contribution margin, the breakeven quantity will decrease.  
Answer: FALSE  
Explanation: In multiproduct situations when sales mix shifts toward the product with the lowest contribution margin, the breakeven quantity will increase.  
Diff: 3  
Terms: sales mix  
Objective: 7  
AACSB: Reflective thinking
16) In multiproduct situations when sales mix shifts toward the product with the highest contribution margin, operating income will be higher.
Answer: TRUE
Diff: 3
Terms: sales mix
Objective: 7
AACSB: Reflective thinking

17) To calculate the breakeven point in a multiproduct situation, one must assume that the sales mix of the various products remains constant.
Answer: TRUE
Diff: 2
Terms: sales mix
Objective: 7
AACSB: Ethical reasoning

18) If a company's sales mix is 2 units of product A for every 3 units of product B, and the company sells 3,000 units in total of both products, only 2,000 units of product A will be sold.
Answer: FALSE
Explanation: If a company's sales mix is 2 units of product A for every 3 units of product B, and the company sells 3,000 units in total of both products, 1,200 units of product A will be sold and 1,800 units of product B will be sold.
Diff: 2
Terms: sales mix
Objective: 7
AACSB: Analytical skills

19) Ken's Beer Emporium sells beer and ale in both pint and quart sizes. If Ken's sells twice as many pints as it sells quarts, and sells 2,400 items total, it will sell 800 quarts of ale.
Answer: TRUE
Diff: 2
Terms: sales mix
Objective: 7
AACSB: Analytical skills
20) Karen Hefner, a florist, operates retail stores in several shopping malls. The average selling price of an arrangement is $30 and the average cost of each sale is $18. A new mall is opening where Karen wants to locate a store, but the location manager is not sure about the rent method to accept. The mall operator offers the following three options for its retail store rentals:

1. paying a fixed rent of $15,000 a month, or
2. paying a base rent of $9,000 plus 10% of revenue received, or
3. paying a base rent of $4,800 plus 20% of revenue received up to a maximum rent of $25,000.

**Required:**
a. For each option, compute the breakeven sales and the monthly rent paid at break-even.
b. Beginning at zero sales, show the sales levels at which each option is preferable up to 5,000 units.

**Answer:**
a. **Option 1**

\[ 30N - 18N - 15,000 = 0 \]
\[ 12N - 15,000 = 0 \]
\[ N = \frac{15,000}{12} = 1,250 \text{ units} \]

Rent at breakeven = $15,000

**Option 2**

\[ 30N - 18N - 0.10(30N) - 9,000 = 0 \]
\[ 9N - 9,000 = 0 \]
\[ N = \frac{9,000}{9} = 1,000 \text{ units} \]

Rent at breakeven = $9,000 + (0.10 \times 30 \times 1,000) = $12,000

**Option 3**

\[ 30N - 18N - 0.20(30N) - 4,800 = 0 \]
\[ 6N - 4,800 = 0 \]
\[ N = \frac{4,800}{6} = 800 \text{ units} \]

Rent at breakeven = $4,800 + (0.20 \times 30 \times 800) = $9,600

b. Option 3 from 0 to 1,400 units for $4,800 plus $6 per unit.
Option 2 from 1,401 to 2,000 for $9,000 plus $3 per unit.
Option 1 above 2,000 for $15,000.

Option 1 equals Option 2 when sales are 2,000 and favors Option 1 above 2,000 units.
\[ 15,000 = 9,000 + 0.10(30N); 6,000 = 3N; \quad N = 2,000 \]

Option 1 equals Option 3 when sales are 1,700 and favors Option 1 above 1,700 units.
\[ 15,000 = 4,800 + 0.20(30N); 10,200 = 6N; \quad N = 1,700 \text{ units} \]

Diff: 3

Terms: breakeven point (BEP)
Objective: 2, 7
AACSB: Analytical skills
21) Sprint Manufacturing Company produces two products, X and Y. The following information is presented for both products:

<table>
<thead>
<tr>
<th></th>
<th>X</th>
<th>Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>$30</td>
<td>$20</td>
</tr>
<tr>
<td>VC</td>
<td>20</td>
<td>5</td>
</tr>
</tbody>
</table>

Total fixed costs are $292,500.

**Required:**

a. Calculate the contribution margin for each product.

b. Calculate breakeven point in units of both X and Y if the sales mix is 3 units of X for every unit of Y.

c. Calculate breakeven volume in total dollars if the sales mix is 2 units of X for every 3 units of Y.

**Answer:**

a. X: $30 - $20 = $10  
   Y: $20 - $5 = $15

b. 
   
   \[(3 \times $10) + (1 \times $15) = $45\]
   
   \[\frac{\$292,500}{\$45} = 6,500 \text{ units}\]
   
   X: 6,500 \times 3 = 19,500 \text{ units}  
   
   Y: 6,500 \times 1 = 6,500 \text{ units}  

c. 
   
   \[(2 \times $10) + (3 \times $15) = $65\]
   
   \[\frac{\$292,500}{\$65} = 4,500 \text{ units}\]
   
   X: 4,500 \times 2 = 9,000 \times $30 = $270,000  
   
   Y: 4,500 \times 3 = 13,500 \times $20 = 270,000  
   
   Total dollar sales = $540,000

Diff: 3

Terms: sales mix, breakeven point (BEP), sensitivity analysis

Objective: 2, 7

AACSB: Analytical skills
22) Ballpark Concessions currently sells hot dogs. During a typical month, the stand reports a profit of $9,000 with sales of $50,000, fixed costs of $21,000, and variable costs of $0.64 per hot dog.

Next year, the company plans to start selling nachos for $3 per unit. Nachos will have a variable cost of $0.72 and new equipment and personnel to produce nachos will increase monthly fixed costs by $8,808. Initial sales of nachos should total 5,000 units. Most of the nacho sales are anticipated to come from current hot dog purchasers, therefore, monthly sales of hot dogs are expected to decline to $20,000.

After the first year of nacho sales, the company president believes that hot dog sales will increase to $33,750 a month and nacho sales will increase to 7,500 units a month.

**Required:**

a. Determine the monthly breakeven sales in dollars before adding nachos.
b. Determine the monthly breakeven sales during the first year of nachos sales, assuming a constant sales mix of 1 hotdog and 2 units of nachos.

**Answer:**
a. Contribution margin = Fixed costs + Profit
   \[ = $21,000 + $9,000 = $30,000 \]
   Variable costs = Sales - Contribution margin
   \[ = $50,000 - $30,000 = $20,000 \]
   Units sold = $20,000/$0.64 = 31,250 units
   Selling price = $50,000/31,250 = $1.60 per unit
   Unit Variable costs = $20,000/31,250 = $0.64
   \[ N = \text{Breakeven units} \]
   \[ $1.60N - 0.64N - 21,000 = 0 \]
   \[ 0.96N - 21,000 = 0 \]
   \[ N = \frac{21,000}{0.96} = 21,875 \text{ units} \]

b. Ratio equal to 1 hot dog to 2 units of nachos.
   \[ N = \text{Breakeven number of units of hot dogs} \]
   \[ 2N = \text{Breakeven number of units of nachos} \]
   \[ $3(2)N + 1.60N - 0.72(2N) - 0.64N - 29,808 = 0 \]
   \[ $7.60N - 2.08N - 29,808 = 0 \]
   \[ N = \frac{29,808}{5.52} = 5,400 \text{ hot dogs} \]

Therefore, 5,400 hot dogs and 10,800 units of nachos need to be sold to break even.

**Diff:** 3

**Terms:** breakeven point (BEP), sales mix

**Objective:** 2, 7

**AACSB:** Analytical skills
23) Bob's Textile Company sells shirts for men and boys. The average selling price and variable cost for each product are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Men's</th>
<th>Boys'</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling Price</td>
<td>$28.80</td>
<td>$24.00</td>
</tr>
<tr>
<td>Variable Cost</td>
<td>$20.40</td>
<td>$16.80</td>
</tr>
</tbody>
</table>

Fixed costs are $38,400.

Required:

a. What is the breakeven point in units for each type of shirt, assuming the sales mix is 2:1 in favor of men's shirts?

b. What is the operating income, assuming the sales mix is 2:1 in favor of men's shirts, and sales total 9,000 shirts?

Answer:

a. \( N = \) breakeven in boys' shirts \( 2N = \) breakeven in men's shirts

\[
\begin{align*}
24N + 28.80(2N) - 16.80N - 20.40(2N) - 38,400 &= 0 \\
81.6N - 57.6N - 38,400 &= 0 \\
24N - 38,400 &= 0 \\
N &= \frac{38,400}{24} = 1,600 \text{ shirts}
\end{align*}
\]

Therefore, to break even, 1,600 boys' shirts and 3,200 men's shirts need to be sold.

b.

<table>
<thead>
<tr>
<th></th>
<th>Boys' 3,000</th>
<th>Men's 6,000</th>
<th>Total 9,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>$72,000</td>
<td>$172,800</td>
<td>$244,800</td>
</tr>
<tr>
<td>Variable costs</td>
<td>50,400</td>
<td>122,400</td>
<td>172,800</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$21,600</td>
<td>$50,400</td>
<td>$72,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>38,400</td>
<td>38,400</td>
<td>38,400</td>
</tr>
<tr>
<td>Operating income</td>
<td></td>
<td></td>
<td>$33,600</td>
</tr>
</tbody>
</table>

Diff: 3

Terms: sales mix, breakeven point (BEP)

Objective: 7

AACSB: Analytical skills
24) Mount Carmel Company sells only two products, Product A and Product B.

<table>
<thead>
<tr>
<th></th>
<th>Product A</th>
<th>Product B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>$40</td>
<td>$50</td>
<td></td>
</tr>
<tr>
<td>Variable cost per unit</td>
<td>$24</td>
<td>$40</td>
<td></td>
</tr>
<tr>
<td>Total fixed costs</td>
<td></td>
<td></td>
<td>$840,000</td>
</tr>
</tbody>
</table>

Mount Carmel sells two units of Product A for each unit it sells of Product B. Mount Carmel faces a tax rate of 30%.

Required:

a. What is the breakeven point in units for each product assuming the sales mix is 2 units of Product A for each unit of Product B?

b. What is the breakeven point if Mount Carmel's tax rate is reduced to 25%, assuming the sales mix is 2 units of Product A for each unit of Product B?

c. How many units of each product would be sold if Mount Carmel desired an after-tax net income of $73,500, facing a tax rate of 30%?

Answer:

a. \( N = \text{breakeven in product B} \quad 2N = \text{breakeven in product A} \)

\[
\begin{align*}
(40 \times 2N) + (50 \times N) - (24 \times 2N) - (40 \times N) - 840,000 &= 0 \\
(130 \times N) - (88 \times N) - 840,000 &= 0 \\
42N - 840,000 &= 0 \\
N &= 840,000 / 42 = 20,000 \\
\end{align*}
\]

Therefore, to break even, 40,000 units of Product A and 20,000 units of Product B need to be sold.

b. The breakeven point would be the same. At the breakeven point there is no pre-tax income, so the tax rate change is irrelevant in this situation.

c. \( N = \text{number of units of product B} \quad 2N = \text{number of units of product A} \)

\[
\begin{align*}
(40 \times 2N) + (50 \times N) - (24 \times 2N) - (40 \times N) - 840,000 &= 73,500 / (1 - .3) \\
(130 \times N) - (88 \times N) - 840,000 &= 105,000 \\
42N - 945,000 &= 0 \\
N &= 945,000 / 42 = 22,500 \\
\end{align*}
\]

Therefore, to meet the profit goal, \( 2 \times N = 45,000 \) units of Product A and \( N = 22,500 \) units of Product B need to be sold.

Diff: 3

Terms: sales mix, breakeven point (BEP), net income

Objective: 7

AACSB: Analytical skills
25) Atlanta Radio Supply sells only two products, Product X and Product Y.

<table>
<thead>
<tr>
<th></th>
<th>Product X</th>
<th>Product Y</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>$25</td>
<td>$45</td>
<td></td>
</tr>
<tr>
<td>Variable cost per unit</td>
<td>$20</td>
<td>$35</td>
<td></td>
</tr>
<tr>
<td>Total fixed costs</td>
<td></td>
<td></td>
<td>$350,000</td>
</tr>
</tbody>
</table>

Atlanta Radio Supply sells three units of Product X for each two units it sells of Product Y. Atlanta Radio Supply has a tax rate of 25%.

**Required:**

a. What is the breakeven point in units for each product, assuming the sales mix is 3 units of Product X for each two units of Product Y?
b. How many units of each product would be sold if Atlanta Radio Supply desired an after-tax net income of $210,000, using its tax rate of 25%?

Answer:

a. \[3N = \text{breakeven in product X}\] \[2N = \text{breakeven in product Y}\]

\[($25 -$20) \times 3N + ($45 - $35) \times 2N -$350,000 = 0\]
\[15N + 20N - 350,000 = 0\]
\[35N - 350,000 = 0\]
\[N = $350,000 / $35 = 10,000\]

Therefore, to break even, 30,000 (10,000 x 3) units of Product X and 20,000 (10,000 x 2) units of Product Y need to be sold.

b. \[3N = \text{number of units of product X}\] \[2N = \text{number of units of product Y}\]

\[($25 -$20) \times 3N + ($45 - $35) \times 2N -$350,000 = $210,000 / (1 - .25)\]
\[15N + 20N - 350,000 = 280,000\]
\[35N - 350,000 = 280,000\]
\[35N - 630,000 = 0\]
\[N = 630,000 / $35 = 18,000\]

Therefore, to meet the profit goal, 3 \times N = 54,000 units of Product X and 2 \times N = 36,000 units of Product Y need to be sold.

Diff: 3

Terms: sales mix, breakeven point (BEP), net income
Objective: 7
AACSB: Analytical skills
26) Pennsylvania Valve Company makes three types of valves: Speedy Flow, Sure Flow, and Fine Flow. Each of the three products has a different contribution margin, and the proportions of the three products sold have remained steady over the years. How could Pennsylvania valve compute a breakeven point given this situation?

Answer: Pennsylvania Valve could consider that it makes a single composite product that represents all three products given the constant sales mix. For example, if the ratio is 3 Speedy, 2 Sure Flow, and 1 Fine Flow, Pennsylvania Valve could calculate a weighted average contribution margin for the composite product based on the contribution margins of the individual products using the relative sales mix as weights. Pennsylvania Valve could then divide the fixed costs by this composite contribution margin to determine how many composite units would be needed to be sold to cover the fixed costs. Then the sales mix could be used to determine how many units of each real product is in each composite unit. Thus, if 10,000 composite units were required to break even and the sales mix is 3 Speedy, 2 Sure Flow, and 1 Fine Flow, Pennsylvania Valve would need to sell 30,000 units of Speedy, 20,000 units of Sure Flow and 10,000 units of Fine Flow to break even.

Diff: 3
Terms: breakeven point (BEP), sales mix
Objective: 7
AACSB: Reflective thinking

Objective 3.A

1) Multiple cost drivers:
A) have only one revenue driver
B) can utilize the simple CVP formula
C) have no unique breakeven point
D) are the result of multiple products
Answer: C
Diff: 2
Terms: cost-volume-profit (CVP) analysis
Objective: A
AACSB: Reflective thinking

2) A nonprofit organization aids the unemployed by supplementing their incomes by $3,200 annually, while they seek new employment skills. The organization has fixed costs of $240,000 and the budgeted appropriation for the year totals $800,000. How many individuals can receive financial assistance this year?
A) 175 people
B) 130 people
C) 100 people
D) 75 people
Answer: A
Explanation: A) $800,000 - $3,200N - $240,000 = 0; $560,000 = $3,200N; N = 175 people
Diff: 2
Terms: cost-volume-profit (CVP) analysis
Objective: A
AACSB: Analytical skills
3) Helping Hands is a nonprofit organization that supplies electric fans during the summer for individuals in need. Fixed costs are $200,000. The fans cost $20.00 each. The organization has a budgeted appropriation of $480,000. How many people can receive a fan during the summer? A) 12,000 people B) 14,000 people C) 24,000 people D) 34,000 people Answer: B Explanation: B) $480,000 - $20N - $200,000 = 0; $280,000 = $20N; N = 14,000 people Diff: 2 Terms: cost-volume-profit (CVP) analysis Objective: A AACSB: Analytical skills

4) Mount Carmel Company sells only two products, Product A and Product B.

<table>
<thead>
<tr>
<th></th>
<th>Product A</th>
<th>Product B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>$40</td>
<td>$50</td>
<td></td>
</tr>
<tr>
<td>Variable cost per unit</td>
<td>$24</td>
<td>$40</td>
<td></td>
</tr>
<tr>
<td>Total fixed costs</td>
<td></td>
<td></td>
<td>$840,000</td>
</tr>
</tbody>
</table>

Mount Carmel sells two units of Product A for each unit it sells of Product B. Mount Carmel faces a tax rate of 30%. Mount Carmel desires a net after-tax income of $73,500. The breakeven point in units would be: A) 21,750 units of Product A and 43,500 units of Product B B) 22,500 units of Product A and 45,000 units of product B C) 43,500 units of Product A and 21,750 units of Product B D) 45,000 units of Product A and 22,500 units of Product B Answer: D Explanation: D) Desired pre-tax net income $73,500 / (1.0 - .3) = $105,000 Weighted contribution margin [2 × ($40 - $24)] + [1 × ($50 - $40)] = $42 Breakeven point in composite units is ($105,000 + $840,000) / $42 = 22,500 22,500 composite units is (2 × 22,500) = 45,000 units of A and (1 × 22,500) = 22,500 units of B Diff: 3 Terms: sales mix Objective: A AACSB: Analytical skills

5) "Uncertainty" may be defined as: A) the possibility that an actual amount will be the same as an expected amount B) the possibility that an actual amount will be either higher or lower than the expected amount C) the possibility that a budgeted amount will be higher than the estimated amount D) the possibility that the budgeted amount will be lower than the estimated amount Answer: B Diff: 1 Terms: uncertainty Objective: A AACSB: Reflective thinking
6) Events, as distinguished from actions, would include:
A) personnel policy options
B) decisions on time schedules
C) decisions on direct material vendors
D) a financial recession
Answer: D
Diff: 3
Terms: uncertainty
Objective: A
AACSB: Ethical reasoning

7) Expected monetary value may be defined as:
A) the probability that each outcome will occur
B) the probability that each outcome will not occur
C) the weighted average of the outcomes with the probability of each outcome serving as the weight
D) the average of all possible outcomes
Answer: C
Diff: 1
Terms: expected monetary value
Objective: A
AACSB: Reflective thinking

8) What would be the expected monetary value for the following data using the probability method?

<table>
<thead>
<tr>
<th>Probability</th>
<th>Cash Inflows</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.20</td>
<td>$200,000</td>
</tr>
<tr>
<td>0.30</td>
<td>$160,000</td>
</tr>
<tr>
<td>0.15</td>
<td>$120,000</td>
</tr>
<tr>
<td>0.35</td>
<td>$0</td>
</tr>
</tbody>
</table>

A) $40,000  
B) $188,000  
C) $106,000  
D) $60,000
Answer: C
Explanation: C) 0.20($200,000) + 0.30($160,000) + 0.15($120,000) = $106,000
Diff: 2
Terms: expected monetary value
Objective: A
AACSB: Analytical skills
9) Lobster Liquidators will make $500,000 if the fishing season weather is good, $200,000 if the weather is fair, and would actually lose $50,000 if the weather is poor during the season. If the weather service gives a 40% probability of good weather, a 25% probability of fair weather, and a 35% probability of poor weather, what is the expected monetary value for Lobster Liquidators?
A) $500,000
B) $232,500
C) $267,500
D) $200,000
Answer:  B
Explanation:  B) 0.40($500,000) + 0.25($200,000) + 0.35(-$5,000) = $232,500
Diff: 2
Terms:  expected monetary value
Objective:  A
AACSB:  Analytical skills

Answer the following questions using the information below:

Patrick Ross has three booth rental options at the county fair where he plans to sell his new product. The booth rental options are:

- Option 1: $1,000 fixed fee, or
- Option 2: $750 fixed fee + 5% of all revenues generated at the fair, or
- Option 3: 20% of all revenues generated at the fair.

The product sells for $37.50 per unit. He is able to purchase the units for $12.50 each.

10) How many actions and events will a decision table contain?
A) 1 action and 3 events
B) 1 action and 6 events
C) 2 actions and 3 events
D) 3 actions and 6 events
Answer:  D
Diff: 2
Terms:  decision table
Objective:  A
AACSB:  Analytical skills
11) Which option should Patrick choose to maximize income assuming there is a 40% probability that 70 units will be sold and a 60% probability that 40 units will be sold?

A) Option 1  
B) Option 2  
C) Option 3  
D) All options maximize income equally.

Answer: C

Explanation:

C) Expected revenues = 0.4(70 × $37.50) + 0.6(40 × $37.50) = $1,950

Expected CM before options = 0.4(70 × $25) + 0.6(40 × $25) = $1,300

Option 1: $1,300 - $1,000 = $300
Option 2: $1,300 - $750 - 0.05($1,950) = $452.50
Option 3: $1,300 - 0.2($1,950) = $910*

* = maximization of income

Diff: 3  
Terms: decision table  
Objective: A  
AACSB: Analytical skills

12) There is no unique breakeven point when there are multiple cost drivers.

Answer: TRUE

Diff: 2  
Terms: cost-volume-profit (CVP) analysis  
Objective: A  
AACSB: Analytical skills

13) When there are multiple cost drivers the simple CVP formula of Q = (FC + OI)/CMU can still be used.

Answer: FALSE

Explanation: When there are multiple cost drivers the simple CVP formula no longer applies.

Diff: 1  
Terms: cost-volume-profit (CVP) analysis  
Objective: A  
AACSB: Reflective thinking

14) An expected value is the weighted average of the outcomes, with the probability of each outcome serving as the weight.

Answer: TRUE

Diff: 2  
Terms: expected value  
Objective: A  
AACSB: Communication
15) Produce Company needs to know the pounds of apples to have on hand each day. Each pound of apples costs $0.50 and can be sold for $0.80. Unsold apples are worthless at the end of the day. The following demands were found after studying the last six months’ sales:

200 pounds of apples 30% of the time
300 pounds of apples 40% of the time
400 pounds of apples 30% of the time

Required:
Determine whether Produce Company should order 200, 300, or 400 pounds of apples.

Answer:

<table>
<thead>
<tr>
<th>Quantity Ordered</th>
<th>Demand Probability</th>
<th>Expected Value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>200</td>
<td>300</td>
</tr>
<tr>
<td>200</td>
<td>$60</td>
<td>$60</td>
</tr>
<tr>
<td>300</td>
<td>10</td>
<td>90</td>
</tr>
<tr>
<td>400</td>
<td>(40)</td>
<td>40</td>
</tr>
<tr>
<td>p</td>
<td>0.30</td>
<td>0.40</td>
</tr>
</tbody>
</table>

Demand example: 300 units ordered; but demand is either 300 or 400 units:

\[(0.80 \times 300) - (0.50 \times 300) = 90\]

Expected value example:
Order 400: \((40 \times 0.30) + (40 \times 0.40) + (120 \times 0.30) = 40\)

Answer: Should order 300 pounds of apples to maximize profit.

Diff: 3
Terms: expected value
Objective: A
AACSB: Analytical skills

16) Lauren had been a manager of a major hotel chain for 15 years. Due to a hotel owner's illness, Lauren was offered the opportunity to purchase a hotel near a vacation area she had often visited. After obtaining a lawyer and an accountant to assist her, Lauren did an analysis of the business and evaluated several contingencies relating to various scenarios that might occur based on economic and weather season circumstances. Since the expected monetary value of the various scenarios was much higher than the price of the hotel, she decided to purchase the hotel. She resigned her position, obtained a loan, and purchased the hotel. The following year, there was a severe economic downturn and also a very bad weather season that reduced the number of guests and also caused a resulting mold situation in the hotel building that required expensive repair work. Lauren ran short of cash, became emotionally distraught, and eventually had to sell the hotel at a significant loss. Was it a bad decision for her to purchase the hotel instead of keeping her other managerial position? Explain.
Answer: It was not necessarily a bad decision for Lauren to purchase the hotel. Decisions are made based on information that is available at the time of evaluating and making the decision. By definition, the nature of uncertainty rules out any guarantees regarding the specific outcome that will be obtained. There are some cases where a bad outcome is obtained even when a good decision has been made. Although the best protection against a bad outcome is a good decision, you can never be 100% certain of a good outcome.

Diff: 3
Terms: outcome
Objective: A
AACSB: Reflective thinking
1) Job costing information is used:
A) to develop strategies
B) to make pricing decisions
C) for external financial reporting
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: job
Objective: 1
AACSB: Reflective thinking

2) Product costing information is used by managers:
A) to make decisions and strategy
B) for planning and control
C) for cost management
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: job-costing system
Objective: 1
AACSB: Communication

3) A _______ is a grouping of individual indirect cost items.
A) cost allocation base
B) cost assignment
C) cost pool
D) job-costing system
Answer: C
Diff: 1
Terms: cost pool
Objective: 1
AACSB: Reflective thinking

4) Each indirect-cost pool of a manufacturing firm:
A) utilizes a separate cost-allocation rate
B) is a subset of total indirect costs
C) relates to one cost object
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: cost pool
Objective: 1
AACSB: Reflective thinking
5) Direct costs
A) are anything for which a measurement of costs is desired.
B) are costs related to a particular cost object that can be traced to that cost object in an economically feasible (cost-effective) way
C) focus specifically on the costing needs of the CFO
D) provide all information for management decision needs
Answer: B  
Diff: 2
Terms: direct costs of a cost object
Objective: 1
AACSB: Reflective thinking

6) In a costing system:
A) cost tracing allocates indirect costs
B) cost allocation assigns direct costs
C) a cost-allocation base can be either financial or nonfinancial
D) a cost object should be a product and not a department or a geographic territory
Answer: C  
Diff: 2
Terms: cost-allocation base
Objective: 1
AACSB: Reflective thinking

7) Assigning direct costs to a cost object is called:
A) cost allocation
B) cost assignment
C) cost pooling
D) cost tracing
Answer: D  
Diff: 1
Terms: job-costing system
Objective: 1
AACSB: Reflective thinking

8) ________ is the process of distributing indirect costs to products.
A) Cost allocation
B) Job cost recording
C) Cost pooling
D) Cost tracing
Answer: A  
Diff: 1
Terms: cost allocation base
Objective: 1
AACSB: Reflective thinking
9) A ________ links an indirect cost to a cost object.
A) cost-allocation base
B) cost pool
C) cost assignment
D) cost tracing
Answer: A  
Diff: 1
Terms: cost allocation base
Objective: 1
AACSB: Reflective thinking

10) Which of the following includes both traced direct costs and allocated indirect costs?
A) cost tracing
B) cost pools
C) cost assignments
D) cost allocations
Answer: C  
Diff: 1
Terms: job-costing system
Objective: 1
AACSB: Reflective thinking

11) The cost allocation base
A) is a grouping of individual indirect cost items.
B) are costs related to a particular cost object that cannot be traced to that cost object in an economically feasible way.
C) is anything for which a measurement of costs is desired.
D) is a systematic way to link an indirect cost or group of indirect costs to cost objects.
Answer: D  
Diff: 1
Terms: cost allocation base
Objective: 1
AACSB: Reflective thinking

12) Direct costs are allocated to the cost object using a cost-allocation method.
Answer: FALSE  
Explanation: Indirect costs are allocated to the cost object using a cost-allocation method.
Diff: 1
Terms: cost-allocation base
Objective: 1
AACSB: Reflective thinking

13) A cost object is anything for which a measurement of costs is desired.
Answer: TRUE  
Diff: 1
Terms: direct costs of a cost object, indirect costs of a cost object
Objective: 1
AACSB: Reflective thinking
14) Direct costs of a cost object are costs related to a particular cost object that can be allocated to that cost object in an economically feasible (cost-effective) way.
Answer: FALSE
Explanation: Direct costs of a cost object -- costs related to a particular cost object that can be traced to that cost object in an economically feasible (cost-effective) way.
Diff: 1
Terms: fixed cost, variable cost
Objective: 1
AACSB: Reflective thinking

15) The cost-allocation base is a systematic way to link an indirect cost or group of indirect costs to cost objects.
Answer: TRUE
Diff: 2
Terms: job
Objective: 1
AACSB: Reflective thinking

16) Cost objects may be jobs, products, or customers.
Answer: TRUE
Diff: 1
Terms: job
Objective: 1
AACSB: Reflective thinking

17) The cost driver of an indirect cost is often used as the cost-allocation base.
Answer: TRUE
Diff: 1
Terms: cost-allocation base
Objective: 1
AACSB: Reflective thinking
18) For each item below indicate the source documents that would most likely authorize the journal entry in a job-costing system.

**Required:**

a. direct materials purchased  
   Answer: a. purchase invoice
b. direct materials used  
   Answer: b. materials requisition record
c. direct manufacturing labor  
   Answer: c. labor time card/record
d. indirect manufacturing labor  
   Answer: d. labor time card
e. finished goods control  
   Answer: e. job-cost record
f. cost of goods sold  
   Answer: f. sales invoice

Diff: 2
Terms: job costing system
Objective: 1
AACSB: Analytical skills

19) Give three examples of costs that can be considered indirect for a product and direct for a department.

Answer: (Answers may vary.)
Supervision, engineering, and quality control

Diff: 2
Terms: direct costs, indirect costs
Objective: 1
AACSB: Reflective thinking

Objective 4.2

1) ______ costing is used by a business to price homogeneous products.
   A) Actual  
   B) Job  
   C) Process  
   D) Traditional  
   Answer: C
   Diff: 1
Terms: process costing
Objective: 2
AACSB: Reflective thinking
2) Process costing:
A) allocates all product costs, including materials and labor
B) results in different costs for different units produced
C) is commonly used by general contractors who construct custom-built homes
D) is used exclusively in manufacturing
Answer: A
Diff: 2
Terms: process costing
Objective: 2
AACSB: Reflective thinking

3) ________ costing is used by a business to price unique products for different jobs.
A) Actual  
B) Job  
C) Process  
D) Traditional  
Answer: B
Diff: 1
Terms: job-costing system
Objective: 2
AACSB: Reflective thinking

4) Job costing:
A) can only be used in manufacturing  
B) records the flow of costs for each customer  
C) allocates an equal amount of cost to each unit made during a time period  
D) is commonly used when each unit of output is identical
Answer: B
Diff: 2
Terms: job-costing system
Objective: 2
AACSB: Reflective thinking

5) Job-costing may only be used by:
A) service companies  
B) merchandising companies  
C) manufacturing companies  
D) All of these may use job-costing.
Answer: D
Diff: 2
Terms: job costing system
Objective: 2
AACSB: Reflective thinking
6) Many large companies which have multiple production methods and processes have hybrid costing systems that are:
A) job-costing
B) actual costing
C) process costing
D) a mix of job-costing and process costing
Answer: D
Diff: 2
Terms: job costing system, process-costing system
Objective: 2
AACSB: Reflective thinking

7) Which of the following companies is most likely to use a process costing system.
A) a manufacturer of breakfast cereal
B) a manufacturer of large commercial aircraft
C) a custom jewelry manufacturer
D) a law firm
Answer: A
Diff: 1
Terms: process costing
Objective: 2
AACSB: Reflective thinking

8) A company may use job costing to assign costs to different product lines and then use process costing to calculate unit costs within each product line.
Answer: TRUE
Diff: 2
Terms: job-costing system, process-costing system
Objective: 2
AACSB: Analytical skills

9) In each period, job costing divides the total cost of producing an identical or similar product by the total number of units produced to obtain a per-unit cost.
Answer: FALSE
Explanation: This describes process-costing.
Diff: 2
Terms: job-costing system, process-costing system
Objective: 2
AACSB: Reflective thinking

10) Job costing is commonly used to estimate costs in beverage production.
Answer: FALSE
Explanation: Process costing is commonly used to estimate costs in beverage production.
Diff: 1
Terms: job-costing system, process-costing system
Objective: 2
AACSB: Reflective thinking
11) In a job-costing system the cost object is an individual unit, batch, or lot of a distinct product or service.
   Answer: TRUE
   Diff: 1
   Terms: job-costing system
   Objective: 2
   AACSB: Reflective thinking

12) Normal costing is a method of job costing that allocates an indirect cost based on the actual indirect-cost rate times the actual quantity of the cost-allocation base.
   Answer: FALSE
   Explanation: Actual costing is a method of job costing that allocates an indirect cost based on the actual indirect-cost rate times the actual quantity of the cost-allocation base.
   Diff: 1
   Terms: actual costing
   Objective: 2
   AACSB: Reflective thinking

13) Process costing is used to assign manufacturing costs to unique batches of a product.
   Answer: FALSE
   Explanation: Job costing is used to assign manufacturing costs to unique batches of a product.
   Diff: 1
   Terms: process-costing system
   Objective: 2
   AACSB: Reflective thinking

14) Job costing and process costing systems share the same objective of estimating product costs.
   Answer: TRUE
   Diff: 1
   Terms: job-costing system, process-costing system
   Objective: 2
   AACSB: Reflective thinking

15) While costs are measured for individual jobs in a job cost system, they are measured for individual process stages in a process costing system.
   Answer: TRUE
   Diff: 1
   Terms: process-costing system
   Objective: 2
   AACSB: Reflective thinking
16) Describe job-costing and process-costing systems. Explain when it would be appropriate to use each.

Answer: Job costing accumulates costs for different jobs required by specific customers. Process costing computes and allocates an equal amount of cost to each product. Job costing is the logical choice when the production process has many distinct products or many heterogeneous jobs, while process costing is typically used when it is not necessary to keep separate cost records for individual jobs and the products are relatively homogeneous.

Diff: 2
Terms: job costing system, process-costing system
Objective: 1, 2
AACSB: Reflective thinking

Objective 4.3

1) Which of the following are reasons for using longer periods, such as a year, to calculate indirect cost rates.
   A) Numerator reason
   B) Denominator reason
   C) Both A and B
   D) Neither A nor B

Answer: C
Diff: 1
Terms: indirect-cost rate
Objective: 3
AACSB: Reflective thinking

2) The actual indirect-cost rate is calculated by
   A) dividing actual total indirect costs by the actual total quantity of the cost-allocation base.
   B) multiplying actual total indirect costs by the actual total quantity of the cost-allocation base.
   C) dividing the actual total quantity of the cost allocation base by actual total indirect costs.
   D) multiplying the actual total quantity of the cost allocation base by actual total indirect costs.

Answer: A
Diff: 1
Terms: indirect-cost rate
Objective: 3
AACSB: Analytical skills

3) Actual costing is a costing system that traces direct costs to a cost object by
   A) using the budgeted direct cost rates times the budgeted quantities of direct-cost inputs.
   B) using the actual direct costs rates times the budgeted quantities of the direct-cost inputs.
   C) using the actual direct cost rates times the actual quantities of the direct-cost inputs.
   D) using the budgeted direct cost rates times the actual quantities of the direct cost inputs.

Answer: C
Diff: 1
Terms: actual costing
Objective: 3
AACSB: Analytical skills
4) An example of a denominator reason for calculating annual indirect-cost rates includes:
A) higher heating bills in the winter
B) semi-annual insurance payments in March and September
C) higher levels of output demanded during the fall months
D) All of these answers are correct.
Answer: C
Diff: 3
Terms: indirect-cost rate
Objective: 3
AACSB: Reflective thinking

5) When calculating indirect cost rates, the longer the time period, the greater the influence of seasonal patterns on the amount of costs.
Answer: FALSE
Explanation: The shorter the time period, the greater the influence of seasonal patterns on the amount of costs.
Diff: 1
Terms: indirect-cost rate
Objective: 3
AACSB: Reflective thinking

6) Actual costing systems are NOT commonly found in practice because actual costs CANNOT be computed in a timely manner.
Answer: TRUE
Diff: 1
Terms: actual costing
Objective: 3
AACSB: Reflective thinking

7) The actual indirect-cost rate is calculated by dividing actual total indirect costs by the actual total quantity of the cost-allocation base.
Answer: TRUE
Diff: 1
Terms: indirect-cost rate
Objective: 3
AACSB: Reflective thinking

Objective 4.4

1) A job that shows low profitability may be the result of:
A) wasting direct materials
B) inefficient direct manufacturing labor
C) underpricing the job
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: job-costing system
Objective: 4
AACSB: Ethical reasoning
2) For a given job the direct costs associated with the job are:
A) actual overhead
B) direct material
C) direct manufacturing labor
D) Both b and c are correct.
Answer: D
Diff: 2
Terms: direct costs of a cost object
Objective: 4
AACSB: Reflective thinking

3) Place the following steps in the order suggested by the seven steps used to assign costs to individual jobs:
   A. Identify indirect costs
   B. Compute the total cost of the job
   C. Select cost-allocation bases
   D. Compute the indirect cost rate
   
   A) ACDB
   B) CADB
   C) BACD
   D) DCAB
Answer: B
Diff: 2
Terms: job-costing system
Objective: 4
AACSB: Analytical skills

4) The basic source document for direct manufacturing labor is the:
   A) job-cost record
   B) materials-requisition record
   C) labor-time record
   D) All of these answers are correct.
Answer: C
Diff: 1
Terms: job-cost record
Objective: 4
AACSB: Reflective thinking

5) Problems with accurate costing occur when:
   A) incorrect job numbers are recorded on source documents
   B) bar coding is used to record materials used on the job
   C) a computer screen requests an employee number before that employee is able to work on information related to a specific job
   D) All of these answers are correct.
Answer: A
Diff: 2
Terms: job-costing system
Objective: 4
AACSB: Communication
6) The budgeted indirect-cost rate for each cost pool is computed as
A) budgeted annual indirect costs divided by budgeted annual quantity of cost allocation base.
B) budgeted annual quantity of cost allocation base divided by budgeted annual indirect costs.
C) actual annual indirect costs divided by budgeted annual quantity of cost allocation base.
D) budgeted annual indirect costs divided by budgeted actual quantity of cost allocation base.
Answer: A
Diff: 3
Terms: indirect-cost rate
Objective: 4
AACSB: Analytical skills

7) If indirect-cost rates are calculated monthly, distortions might occur because of:
A) rental costs paid monthly
B) property tax payments made in July and December
C) routine monthly preventive-maintenance costs that benefit future months
D) Both B and C are correct.
Answer: B
Diff: 2
Terms: indirect-cost rate
Objective: 4
AACSB: Analytical skills

8) Stewart Company's actual manufacturing overhead is $2,800,000. Overhead is allocated on the basis of direct labor hours. The direct labor hours were 50,000 for the period. What is the manufacturing overhead rate?
A) $47.00
B) $56.00
C) $75.00
D) None of the above are correct.
Answer: B
Explanation: B) 2,800,000/50,000 = 56.00
Diff: 2
Terms: actual manufacturing overhead rate
Objective: 4
AACSB: Analytical skills

9) O'Reilly Enterprises manufactures digital video equipment. For each unit $2,950 of direct material is used and there is $2,000 of direct manufacturing labor at $20 per hour. Manufacturing overhead is applied at $35 per direct manufacturing labor hour. Calculate the cost of each unit.
A) $4,950
B) $9,950
C) $8,450
D) $11,950
Answer: C
Explanation: C) 2,950+2,000+((2,000/20)*35)
Diff: 2
Terms: job costing system
Objective: 4
AACSB: Analytical skills
10) An example of a numerator reason for calculating annual indirect-cost rates includes:
A) fewer production workdays in a month
B) payment of estimated taxes four times a year
C) higher snow-removal costs during the winter
D) Both B and C are correct.
Answer: D
Diff: 3
Terms: indirect-cost rate
Objective: 4
AACSB: Reflective thinking

11) In a job-costing system, a manufacturing firm typically uses an indirect-cost rate to estimate the ______ allocated to a job.
A) direct materials
B) direct labor
C) manufacturing overhead costs
D) total costs
Answer: C
Diff: 2
Terms: indirect-cost rate
Objective: 4
AACSB: Reflective thinking

12) A job-cost sheet details the:
A) direct materials purchased and paid
B) direct labor costs incurred
C) indirect labor costs incurred
D) actual indirect overhead costs incurred
Answer: B
Diff: 2
Terms: job-cost sheet
Objective: 4
AACSB: Reflective thinking

13) A job-cost record uses information from:
A) a materials requisition record to record raw material purchases from suppliers
B) a receiving report that indicates the type and quantity of each item received in an order from a supplier
C) a labor-time card to record an employee's wage rate and hours spent on a particular job
D) All of these answers are correct.
Answer: C
Diff: 2
Terms: job-cost record
Objective: 4
AACSB: Reflective thinking
14) Costs that are subject to short-run fluctuations for given jobs are:
A) actual costs
B) budgeted direct costs
C) budgeted indirect costs
D) normal costs
Answer: A
Diff: 1
Terms: actual costing
Objective: 4
AACSB: Reflective thinking

15) Annual cost rates are preferred over actual cost rates for all of the following reasons EXCEPT:
A) budgeted costs allow managers to have cost information on a timely basis
B) budgeted costs may be subject to short-run fluctuations
C) budgeted indirect-cost rates are known prior to the inception of a new job
D) budgeted-cost rates can be used to allocate direct or indirect costs
Answer: B
Diff: 2
Terms: budgeted indirect-cost rate
Objective: 4
AACSB: Reflective thinking

16) Fixed costs remain constant at $400,000 per month. During high-output months variable costs are $320,000, and during low-output months variable costs are $80,000. What are the respective high and low indirect-cost rates if budgeted professional labor-hours are 16,000 for high-output months and 4,000 for low-output months?
A) $45.00 per hour; $120.00 per hour
B) $45.00 per hour; $45.00 per hour
C) $25.00 per hour; $20.00 per hour
D) $56.20 per hour; $120.00 per hour
Answer: A
Explanation: A) $400,000 / 16,000 = $25.00
$320,000 / 16,000 = 20.00
$80,000 / 4,000 = 20.00
High Month = $45.00
Low Month = $120.00
Diff: 2
Terms: indirect-cost rate
Objective: 4
AACSB: Analytical skills

17) Managers and accountants collect most of the cost information that goes into their systems through:
A) an information databank
B) computer programs
C) source documents
D) time surveys
Answer: C
Diff: 1
Terms: source document
Objective: 4
AACSB: Reflective thinking
Answer the following questions using the information below:

For 2010, Jake's Dog Supply Manufacturing uses machine-hours as the only overhead cost-allocation base. The accounting records contain the following information:

<table>
<thead>
<tr>
<th></th>
<th>Estimated</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing overhead costs</td>
<td>$200,000</td>
<td>$240,000</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>40,000</td>
<td>50,000</td>
</tr>
</tbody>
</table>

18) Using job costing, the 2010 actual indirect-cost rate is:
A) $4.00 per machine-hour
B) $4.80 per machine-hour
C) $5.00 per machine-hour
D) $6.00 per machine-hour
Answer:  B
Explanation:  B) $240,000 / 50,000 mh = $4.80
Diff: 2
Terms: indirect-cost rate
Objective: 4
AACSB: Analytical skills

19) Using actual costing, the amount of manufacturing overhead costs allocated to jobs during 2010 is:
A) $300,000
B) $250,000
C) $240,000.
D) $200,000
Answer:  C
Explanation:  C) 50,000 mh × $240,000 / 50,000 mh allocation rate = $240,000
Diff: 2
Terms: actual costing
Objective: 4
AACSB: Analytical skills
Answer the following questions using the information below:

Philadelphia Company manufactures pipes and applies manufacturing overhead costs to production at a budgeted indirect-cost rate of $15 per direct labor-hour. The following data are obtained from the accounting records for June 2010:

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$140,000</td>
</tr>
<tr>
<td>Direct labor (3,500 hours @ $11/hour)</td>
<td>$38,500</td>
</tr>
<tr>
<td>Indirect labor</td>
<td>$10,000</td>
</tr>
<tr>
<td>Plant facility rent</td>
<td>$30,000</td>
</tr>
<tr>
<td>Depreciation on plant machinery and equipment</td>
<td>$15,000</td>
</tr>
<tr>
<td>Sales commissions</td>
<td>$20,000</td>
</tr>
<tr>
<td>Administrative expenses</td>
<td>$25,000</td>
</tr>
</tbody>
</table>

20) The actual amount of manufacturing overhead costs incurred in June 2010 totals:
A) $278,500
B) $100,000
C) $55,000
D) $40,000
Answer: C
Explanation: C) $10,000 + $30,000 + $15,000 = $55,000
Diff: 2
Terms: job-costing system
Objective: 4
AACSB: Analytical skills

Answer the following questions using the information below:

Roiann and Dennett Law Office employs 12 full-time attorneys and 10 paraprofessionals. Direct and indirect costs are applied on a professional labor-hour basis that includes both attorney and paraprofessional hours. Following is information for 20X3:

<table>
<thead>
<tr>
<th>Cost</th>
<th>Budget</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect costs</td>
<td>$270,000</td>
<td>$300,000</td>
</tr>
<tr>
<td>Annual salary of each attorney</td>
<td>$100,000</td>
<td>$110,000</td>
</tr>
<tr>
<td>Annual salary of each paraprofessional</td>
<td>$29,000</td>
<td>$30,000</td>
</tr>
<tr>
<td>Total professional labor-hours</td>
<td>50,000 dlh</td>
<td>60,000 dlh</td>
</tr>
</tbody>
</table>

21) What are the actual direct-cost rate and the actual indirect-cost rate, respectively, per professional labor-hour?
A) $27.00; $4.17
B) $29.80; $5.40
C) $32.40; $5.00
D) $27.00; $5.00
Answer: D
Explanation: D) [($110,000 × 12) + ($30,000 × 10)] / 60,000 = $27.00 actual direct rate
$300,000 / 60,000 = $5.00 actual indirect rate
Diff: 2
Terms: indirect-cost rate
Objective: 4
AACSB: Analytical skills
22) How much should the client be billed in an actual costing system if 200 professional labor-hours are used?
A) $5,000
B) $6,960
C) $7,480
D) $6,400
Answer: D
Explanation:
D) \[
\frac{\left(110,000 \times 12\right) + \left(30,000 \times 10\right)}{60,000 \times 200} = \frac{5,400}{1,000} = 5,400 + 300,000 / 60,000 \times 200 = 6,400
\]

Diff: 3
Terms: actual costing
Objective: 4
AACSB: Analytical skills

23) If indirect-cost rates were based on actual short-term usage, periods of lower demand would result in lower costs per unit.
Answer: FALSE
Explanation: If indirect-cost rates were based on actual short-term usage, periods of lower demand would result in higher costs per unit.
Diff: 3
Terms: indirect-cost rate
Objective: 4
AACSB: Analytical skills

24) In job costing, only direct costs are used to determine the cost of a job.
Answer: FALSE
Explanation: Both direct and indirect costs are used to determine the cost of a job.
Diff: 1
Terms: job-costing system
Objective: 4
AACSB: Reflective thinking

25) Indirect manufacturing costs should be allocated equally to each job.
Answer: FALSE
Explanation: Not equally to each job, but according to the use of indirect resources by individual jobs.
Diff: 2
Terms: indirect-cost rate
Objective: 4
AACSB: Ethical reasoning

26) Each cost pool may have multiple cost allocation bases.
Answer: FALSE
Explanation: There is only one cost-allocation base for each cost pool.
Diff: 2
Terms: cost pool
Objective: 4
AACSB: Analytical skills
27) Normal costing is a costing system that traces direct costs to a cost object by using the actual direct-cost rates times the actual quantities of the direct-cost inputs.
Answer: TRUE
Diff: 1
Terms: normal costing
Objective: 4
AACSB: Reflective thinking

28) A job-cost record is a source document, but individual items of the job-cost record may also have source documents.
Answer: TRUE
Diff: 2
Terms: source document
Objective: 4
AACSB: Reflective thinking

29) A materials-requisition record is an example of a source document.
Answer: TRUE
Diff: 2
Terms: source document
Objective: 4
AACSB: Reflective thinking

30) The reliability of the job-cost records depends on the reliability of the inputs.
Answer: TRUE
Diff: 1
Terms: job-cost record
Objective: 4
AACSB: Reflective thinking

31) To smooth fluctuating levels of output, separate indirect-cost rates should be calculated for each month.
Answer: FALSE
Explanation: To smooth seasonal costs and fluctuating levels of output, indirect-cost rates should be calculated on an annual basis.
Diff: 2
Terms: indirect-cost rate
Objective: 4
AACSB: Reflective thinking

32) Grounds-maintenance costs incurred during the summer months will distort indirect-cost rates that are computed monthly.
Answer: TRUE
Diff: 2
Terms: indirect-cost rate
Objective: 4
AACSB: Reflective thinking
33) One reason for using longer time periods to calculate indirect-cost rates is seasonal cost fluctuations.
Answer: TRUE
Diff: 2
Terms: indirect-cost rate
Objective: 4
AACSB: Reflective thinking

34) Explain how a budgeted indirect-cost rate is determined.
Answer: Manufacturing overhead cost allocation rates are determined by dividing the cost of the resources committed to the manufacturing overhead activity by the capacity made available by the resources committed to the activity.
Diff: 2
Terms: budgeted indirect-cost rate
Objective: 4
AACSB: Reflective thinking

35) What is the difference between an actual cost system and a normal cost system?
Answer: An actual cost system is one that traces direct costs to a cost object by using the actual direct-cost rates times the actual quantities of direct-cost inputs, and allocates indirect costs based on the actual indirect cost rates times the actual quantities of the cost-allocation bases. A normal cost system is one that traces direct costs to a cost object by using the actual direct-cost rates times the actual quantities of direct-cost inputs, and allocates indirect costs based on the budgeted indirect cost rates times the actual quantities of the cost-allocation bases. Both systems trace direct costs to jobs the same way. An actual cost system traces indirect costs to jobs using actual indirect cost rates, but a normal cost system uses budgeted indirect cost rates to trace indirect costs to jobs.
Diff: 2
Terms: actual costing, normal costing
Objective: 4
AACSB: Analytical skills

Objective 4.5

1) The budgeted indirect-cost rate is calculated:
A) at the beginning of the year
B) during the year
C) at the end of each quarter
D) at the end of the year
Answer: A
Diff: 1
Terms: budgeted indirect-cost rate
Objective: 5
AACSB: Reflective thinking
2) The difference between actual costing and normal costing is:
A) normal costing uses actual quantities of direct-costs
B) actual costing uses actual quantities of direct-costs
C) normal costing uses budgeted indirect-costs
D) actual costing uses actual quantities of cost-allocation bases
Answer: C
Diff: 1
Terms: actual costing, normal costing
Objective: 5
AACSB: Reflective thinking

3) Which of the following statements about normal costing is true?
A) Direct costs and indirect costs are traced using an actual rate.
B) Direct costs and indirect costs are traced using budgeted rates.
C) Direct costs are traced using a budgeted rate, and indirect costs are allocated using an actual rate.
D) Direct costs are traced using an actual rate, and indirect costs are allocated using a budgeted rate.
Answer: D
Diff: 2
Terms: normal costing
Objective: 5
AACSB: Reflective thinking

4) When using a normal costing system, manufacturing overhead is allocated using the ________ manufacturing overhead rate and the ________ quantity of the allocation base.
A) budgeted; actual
B) budgeted; budgeted
C) actual; budgeted
D) actual; actual
Answer: A
Diff: 1
Terms: normal costing
Objective: 5
AACSB: Reflective thinking

5) Which of the following statements about actual costing and normal costing is true?
A) Manufacturing costs of a job are available earlier under actual costing.
B) Corrective actions can be implemented sooner under normal costing.
C) Manufacturing costs are available earlier under normal costing.
D) Both B and C are correct.
Answer: D
Diff: 1
Terms: actual costing, normal costing
Objective: 5
AACSB: Reflective thinking
Answer the following questions using the information below:

For 2010, Jake's Dog Supply Manufacturing uses machine-hours as the only overhead cost-allocation base. The accounting records contain the following information:

<table>
<thead>
<tr>
<th></th>
<th>Estimated</th>
<th>Actual</th>
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</thead>
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<tr>
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<td>$240,000</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>40,000</td>
<td>50,000</td>
</tr>
</tbody>
</table>

6) Using job costing, the 2010 budgeted manufacturing overhead rate is:
   A) $4.00 per machine-hour
   B) $4.80 per machine-hour
   C) $5.00 per machine-hour
   D) $6.00 per machine-hour

   Answer:  C
   Explanation:  C) $200,000 / 40,000 mh = $5
   Diff: 2
   Terms:  budgeted indirect-cost rate
   Objective:  5
   AACSB:  Analytical skills

7) Using normal costing, the amount of manufacturing overhead costs allocated to jobs during 2010 is:
   A) $300,000
   B) $250,000
   C) $240,000
   D) $200,000

   Answer:  B
   Explanation:  B) 50,000 mh × $200,000 / 40,000 mh allocation rate = $250,000
   Diff: 2
   Terms:  normal costing
   Objective:  5
   AACSB:  Analytical skills
Answer the following questions using the information below:

Rhett Company has two departments, Machining and Assembly. The following estimates are for the coming year:

<table>
<thead>
<tr>
<th></th>
<th>Machining</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct manufacturing labor-hours</td>
<td>10,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>40,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>$200,000</td>
<td>$400,000</td>
</tr>
</tbody>
</table>

8) A single indirect-cost rate based on direct manufacturing labor-hours for the entire plant is:
A) $8 per direct labor-hour
B) $10 per direct labor-hour
C) $20 per direct labor-hour
D) None of these answers is correct.
Answer: B
Explanation: B) $600,000 / 60,000 dlh = $10
Diff: 2
Terms: indirect-cost rate
Objective: 5
AACSB: Analytical skills

9) The budgeted indirect-cost driver rate for the Machining Department based on the number of machine-hours in that department is:
A) $5 per machine-hour
B) $10 per machine-hour
C) $20 per machine-hour
D) None of these answers is correct.
Answer: A
Explanation: A) $200,000 / 40,000 mh = $5
Diff: 1
Terms: budgeted indirect-cost rate
Objective: 5
AACSB: Analytical skills
Answer the following questions using the information below:

Joni’s Kitty Supplies applies manufacturing overhead costs to products at a budgeted indirect-cost rate of $60 per direct manufacturing labor-hour. A retail outlet has requested a bid on a special order of the Toy Mouse product. Estimates for this order include: Direct materials $40,000; 500 direct manufacturing labor-hours at $20 per hour; and a 20% markup rate on total manufacturing costs.

10) Manufacturing overhead cost estimates for this special order total:
A) $10,000
B) $30,000
C) $36,000
D) None of these answers is correct.
Answer:  B
Explanation:  B) $60 × 500 dlh = $30,000
Diff: 1
Terms: normal costing
Objective:  5
AACSB: Analytical skills

Answer the following questions using the information below:

Gibson Manufacturing is a small textile manufacturer using machine-hours as the single indirect-cost rate to allocate manufacturing overhead costs to the various jobs contracted during the year. The following estimates are provided for the coming year for the company and for the Winfield High School band jacket job.

<table>
<thead>
<tr>
<th></th>
<th>Company</th>
<th>Winfield High School Job</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$40,000</td>
<td>$1,000</td>
</tr>
<tr>
<td>Direct labor</td>
<td>$10,000</td>
<td>$200</td>
</tr>
<tr>
<td>Manufacturing overhead costs</td>
<td>$30,000</td>
<td></td>
</tr>
<tr>
<td>Machine-hours</td>
<td>100,000 mh</td>
<td>900 mh</td>
</tr>
</tbody>
</table>

11) For Gibson Manufacturing, what is the annual manufacturing overhead cost-allocation rate?
A) $0.50
B) $0.80
C) $0.30
D) $33.33
Answer:  C
Explanation:  C) $30,000/100,000 mh = $0.30 per mh
Diff: 2
Terms: indirect-cost rate
Objective:  5
AACSB: Analytical skills
12) What amount of manufacturing overhead costs will be allocated to this job?
A) $270  
B) $720  
C) $450  
D) $30,000  
Answer: A  
Explanation: A) 900 mh × $30,000 / 100,000 mh = $270  
Diff: 2  
Terms: indirect-cost rate  
Objective: 5  
AACSB: Analytical skills

13) What are the total manufacturing costs of this job?
A) $1,200  
B) $1,470  
C) $1,650  
D) $1,920  
Answer: B  
Explanation: B) DM $1,000 + DML $200 + MOH $270 = $1,470  
Diff: 3  
Terms: indirect-cost rate  
Objective: 5  
AACSB: Analytical skills

14) What is the bid price for the Winfield High School job if the company uses a 40% markup of total manufacturing costs?
A) $2,310  
B) $588  
C) $1,680  
D) $2,058  
Answer: D  
Explanation: D) (DM $1,000 + DML $200 + MOH $270) × 1.40 = $2,058  
Diff: 3  
Terms: job-costing system  
Objective: 5  
AACSB: Analytical skills
Answer the following questions using the information below:

Apple Valley Corporation uses a job cost system and has two production departments, A and B. Budgeted manufacturing costs for the year are:

<table>
<thead>
<tr>
<th></th>
<th>Department A</th>
<th>Department B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$700,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>$200,000</td>
<td>$800,000</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>$600,000</td>
<td>$400,000</td>
</tr>
</tbody>
</table>

The actual material and labor costs charged to Job #432 were as follows:

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$25,000</td>
</tr>
<tr>
<td>Direct labor:</td>
<td></td>
</tr>
<tr>
<td>Department A</td>
<td>$ 8,000</td>
</tr>
<tr>
<td>Department B</td>
<td>$12,000</td>
</tr>
<tr>
<td></td>
<td>$20,000</td>
</tr>
</tbody>
</table>

Apple Valley applies manufacturing overhead costs to jobs on the basis of direct manufacturing labor cost using departmental rates determined at the beginning of the year.

15) For Department A, the manufacturing overhead allocation rate is:
   A) 33%
   B) 66%
   C) 300%
   D) 100%
   Answer: C
   Explanation: C) $600,000 / $200,000 = 300%
   Diff: 2
   Terms: indirect-cost rate
   Objective: 5
   AACSB: Analytical skills

16) For Department B, the manufacturing overhead allocation rate is:
   A) 50%
   B) 100%
   C) 200%
   D) 300%
   Answer: A
   Explanation: A) $400,000 / $800,000 = 50%
   Diff: 2
   Terms: indirect-cost rate
   Objective: 5
   AACSB: Analytical skills
17) Manufacturing overhead costs allocated to Job #432 total:
A) $30,000
B) $12,000
C) $24,000
D) $36,000
Answer: A
Explanation: A) \([($8,000 \times $600,000 / $200,000) + [$12,000 \times $400,000/$800,000]] = $30,000
Diff: 3
Terms: manufacturing overhead allocated
Objective: 5
AACSB: Analytical skills

Answer the following questions using the information below:

Roiann and Dennett Law Office employs 12 full-time attorneys and 10 paraprofessionals. Direct and indirect costs are applied on a professional labor-hour basis that includes both attorney and paraprofessional hours. Following is information for 20X3:

<table>
<thead>
<tr>
<th></th>
<th>Budget</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect costs</td>
<td>$270,000</td>
<td>$300,000</td>
</tr>
<tr>
<td>Annual salary of each attorney</td>
<td>$100,000</td>
<td>$110,000</td>
</tr>
<tr>
<td>Annual salary of each paraprofessional</td>
<td>$29,000</td>
<td>$30,000</td>
</tr>
<tr>
<td>Total professional labor-hours</td>
<td>50,000 dlh</td>
<td>60,000 dlh</td>
</tr>
</tbody>
</table>

18) What are the budgeted direct-cost rate and the budgeted indirect-cost rate, respectively, per professional labor-hour?
A) $27.00; $4.17
B) $29.80; $5.40
C) $32.40; $5.00
D) $27.00; $5.00
Answer: B
Explanation:
B) \([($100,000 \times 12) + ($29,000 \times 10)] / 50,000 = $29.80\) budgeted direct rate
\(\frac{$270,000}{50,000} = $5.40\) budgeted indirect rate
Diff: 2
Terms: indirect-cost rate
Objective: 5
AACSB: Analytical skills
19) How much should a client be billed in a normal costing system when 1,000 professional labor-hours are used?
A) $32,000
B) $29,800
C) $35,200
D) $27,000
Answer: C
Explanation:
C) \[\left(\frac{100,000 \times 12}{50,000 \times 1,000}\right) + \frac{29,000 \times 10}{50,000 \times 1000 \times 1,000} = \frac{12,000}{500,000} + \frac{290,000}{50,000,000,000} = \frac{12,000}{500,000} + \frac{290}{50,000} = 0.024 + 0.0058 = 0.0298 \]
Diff: 3
Terms: normal costing
Objective: 5
AACSB: Analytical skills

20) When a normal costing system is used, clients using proportionately more attorney time than paraprofessional time will:
A) be overbilled for actual resources used
B) be underbilled for actual resources used
C) be billed accurately for actual resources used
D) result in an underallocation of direct costs
Answer: B
Diff: 3
Terms: normal costing
Objective: 5
AACSB: Reflective thinking

21) Companies typically wait for accurate information regarding actual manufacturing overhead costs before pricing a job.
Answer: FALSE
Explanation: Companies typically use allocated manufacturing overhead costs to estimate the costs for pricing a job.
Diff: 2
Terms: normal costing
Objective: 5
AACSB: Ethical reasoning

22) The budgeted indirect cost rate is the budgeted indirect costs divided by budgeted quantity of the cost allocation base.
Answer: TRUE
Diff: 2
Terms: budgeted indirect-cost rate
Objective: 5
AACSB: Reflective thinking
23) Direct costs are traced the same way for actual costing and normal costing.
Answer: TRUE
Diff: 2
Terms: actual costing, normal costing
Objective: 5
AACSB: Reflective thinking

24) Normal costing assigns indirect costs based on an actual indirect-cost rate.
Answer: FALSE
Explanation: Normal costing assigns indirect costs based on a budgeted rate.
Diff: 1
Terms: normal costing
Objective: 5
AACSB: Reflective thinking

25) A budgeted indirect-cost rate is computed for each cost pool using budgeted indirect costs and the budgeted quantity of the cost-allocation base.
Answer: TRUE
Diff: 1
Terms: budgeted indirect-cost rate
Objective: 5
AACSB: Reflective thinking

26) For normal costing, even though the budgeted indirect-cost rate is based on estimates, indirect costs are allocated to products based on actual levels of the cost-allocation base.
Answer: TRUE
Diff: 1
Terms: normal costing, budgeted indirect-cost rate, cost-allocation base
Objective: 5
AACSB: Reflective thinking
27) Maddow Manufacturing is a small textile manufacturer using machine-hours as the single indirect-cost rate to allocate manufacturing overhead costs to the various jobs contracted during the year. The following estimates are provided for the coming year for the company and for the Patterson High School Science Olympiad Jacket job.

<table>
<thead>
<tr>
<th></th>
<th>Company</th>
<th>Patterson High School Job</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$25,000</td>
<td>$500</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>$5,000</td>
<td>$100</td>
</tr>
<tr>
<td>Manufacturing overhead costs</td>
<td>$20,000</td>
<td></td>
</tr>
<tr>
<td>Machine-hours</td>
<td>50,000 mh</td>
<td>800 mh</td>
</tr>
</tbody>
</table>

**Required:**

a. For Maddow Manufacturing, determine the annual manufacturing overhead cost-allocation rate.

b. Determine the amount of manufacturing overhead costs allocated to the Patterson High School job.

c. Determine the estimated total manufacturing costs for the Patterson High School job.

**Answer:**

a. Manufacturing overhead cost-allocation rate = $0.40 per mh

b. $320 estimated manufacturing overhead costs = 800 mh × $0.40 per mh

c. Direct materials $500
   Direct manufacturing labor $100
   Manufacturing overhead costs $320
   Estimated total manufacturing costs $920

**Diff: 2**

Terms: job costing system, manufacturing overhead allocated

Objective: 4, 5

AACSB: Analytical skills
28) Hill Manufacturing uses departmental cost driver rates to apply manufacturing overhead costs to products. Manufacturing overhead costs are applied on the basis of machine-hours in the Machining Department and on the basis of direct labor-hours in the Assembly Department. At the beginning of 20X5, the following estimates were provided for the coming year:

<table>
<thead>
<tr>
<th></th>
<th>Machining</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor-hours</td>
<td>10,000 dlh</td>
<td>90,000 dlh</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>100,000 mh</td>
<td>5,000 mh</td>
</tr>
<tr>
<td>Direct labor cost</td>
<td>$ 80,000</td>
<td>$720,000</td>
</tr>
<tr>
<td>Manufacturing overhead costs</td>
<td>$250,000</td>
<td>$360,000</td>
</tr>
</tbody>
</table>

The accounting records of the company show the following data for Job #846:

<table>
<thead>
<tr>
<th></th>
<th>Machining</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor-hours</td>
<td>50 dlh</td>
<td>120 dlh</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>170 mh</td>
<td>10 mh</td>
</tr>
<tr>
<td>Direct material cost</td>
<td>$2,700</td>
<td>$1,600</td>
</tr>
<tr>
<td>Direct labor cost</td>
<td>$ 400</td>
<td>$ 900</td>
</tr>
</tbody>
</table>

**Required:**

a. Compute the manufacturing overhead allocation rate for each department.

b. Compute the total cost of Job #846.

c. Provide possible reasons why Hill Manufacturing uses two different cost allocation rates.

**Answer:**

a. Machining Department cost-allocation rate: $2.50 / mh = $250,000/100,000 mh
   Assembly Department cost-allocation rate: $4.00 / dlh = $360,000/90,000 dlh

b. Total cost of Job #846 is $6,505 = Direct materials $4,300 + Direct labor $1,300 + Manufacturing overhead costs $905 (Machining $425 + Assembly $480).

c. Ideally, the cost-allocation base should reflect the factors that cause manufacturing overhead costs to increase. Apparently, Hill regards the use of machines as the principal cause of manufacturing overhead costs (such as depreciation and repairs) in the Machining Department. In contrast, Hill regards direct labor-hours as the principal cause of manufacturing overhead costs (such as indirect labor) in the Assembly Department.

Diff: 2
Terms: job costing system, manufacturing overhead allocated
Objective: 4, 5
AACSB: Analytical skills
Objective 4.6

1) In a normal costing system, the Manufacturing Overhead Control account:
A) is increased by allocated manufacturing overhead
B) is credited with amounts transferred to Work-in-Process
C) is decreased by allocated manufacturing overhead
D) is debited with actual overhead costs
Answer: D
Diff: 2
Terms: normal costing
Objective: 6
AACSB: Reflective thinking

2) The Materials Control account is increased when:
A) direct materials are purchased
B) indirect materials are purchased
C) materials are requisitioned for production
D) Both A and B are correct.
Answer: D
Diff: 1
Terms: job-costing system
Objective: 6
AACSB: Reflective thinking

3) All of the following are true of the Work-in-Process Control account EXCEPT that:
A) it tracks all direct material purchases
B) the balance equals the sum of amounts from all in-process individual job-cost records
C) it is an asset account
D) it tracks job costs from beginning through completion
Answer: A
Diff: 2
Terms: job-costing system
Objective: 6
AACSB: Use of Information Technology

4) All of the following are general ledger accounts EXCEPT:
A) the Salaries Payable Control account
B) the Prepaid Insurance Control account
C) the Accounts Receivable subsidiary account for Ruben Electric
D) the Advertising Costs account
Answer: C
Diff: 1
Terms: job-costing system
Objective: 6
AACSB: Reflective thinking
5) All of the following increase (are debited to) the Work-in-Process Control account EXCEPT:
A) actual plant insurance costs
B) direct materials
C) allocated manufacturing overhead costs
D) direct manufacturing labor
Answer: A
Diff: 2
Terms: job-costing system
Objective: 6
AACSB: Use of Information Technology

6) When direct materials are requisitioned the ________ account is increased.
A) Manufacturing Overhead Control
B) Work-in-Process Control
C) Materials Control
D) Accounts Payable Control
Answer: B
Diff: 1
Terms: job-costing system
Objective: 6
AACSB: Reflective thinking

7) Payment of the factory rent increases the:
A) Work-in-Process Control account
B) Manufacturing Overhead Control account
C) Both A and B are correct.
D) None of these answers are correct.
Answer: B
Diff: 1
Terms: job-costing system
Objective: 6
AACSB: Reflective thinking

8) All of the following are true of plant utility costs EXCEPT:
A) the source document is the utility bill
B) the cost increases the Manufacturing Overhead Control account
C) the cost increases the Work-in-Process Control account
D) it is an indirect cost
Answer: C
Diff: 1
Terms: job-costing system
Objective: 6
AACSB: Reflective thinking
9) Actual (rather than allocated) manufacturing overhead costs are included in the:
A) Work-in-Process Control account
B) Finished Goods Control account
C) Manufacturing Overhead Control account
D) Both A and B are correct.
Answer: C
Diff: 2
Terms: job-costing system
Objective: 6
AACSB: Reflective thinking

10) The ending balance in the Work-in-Process Control account represents the costs of all jobs that:
A) have not been completed
B) have been completed but not sold
C) have been completed and sold to customers
D) are reported on the income statement
Answer: A
Diff: 1
Terms: job-costing system
Objective: 6
AACSB: Use of Information Technology

11) For externally reported inventory costs, the Work-in-Process Control account is increased (debited) by:
A) marketing costs
B) allocated plant utility costs
C) the purchase costs of direct and indirect materials
D) customer-service costs
Answer: B
Diff: 2
Terms: job-costing system
Objective: 6
AACSB: Use of Information Technology

12) What is the appropriate journal entry if $100,000 of materials were purchased on account for the month of August?
A) Materials Control 100,000
   Accounts Payable Control 100,000
B) Work-in-Process Control 100,000
   Accounts Payable Control 100,000
C) Manufacturing Overhead Control 100,000
   Accounts Receivable Control 100,000
D) Manufacturing Allocated 100,000
   Accounts Receivable Control 100,000
Answer: A
Diff: 2
Terms: job-costing system
Objective: 6
AACSB: Analytical skills
13) What is the appropriate journal entry if direct materials of $20,000 and indirect materials of $3,000 are sent to the manufacturing plant floor?
A) Work-in-Process Control 20,000
   Materials Control 20,000
B) Work-in-Process Control 23,000
   Materials Control 23,000
C) Manufacturing Overhead Control 3,000
   Materials Control 20,000
   Work-in-Process Control 23,000
D) Work-in-Process Control 20,000
   Manufacturing Overhead Control 3,000
   Materials Control 23,000
Answer: D
Diff: 2
Terms: job-costing system
Objective: 6
AACSB: Analytical skills

14) All of the following items are debited to Work-in-Process EXCEPT:
A) allocated manufacturing overhead
B) completed goods being transferred out of the plant
C) direct labor consumed
D) direct materials consumed
Answer: B
Diff: 2
Terms: job-costing system
Objective: 6
AACSB: Reflective thinking

15) What would be the appropriate journal entry if the following labor wages were incurred in a furniture manufacturing company?

<table>
<thead>
<tr>
<th>Labor Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assembly workers</td>
<td>$20,000</td>
</tr>
<tr>
<td>Janitors</td>
<td>$10,000</td>
</tr>
</tbody>
</table>

A) Work-in-Process Control 30,000
   Wages Payable Control 30,000
B) Work-in-Process Control 20,000
   Manufacturing Overhead Control 10,000
   Wages Payable Control 30,000
C) Manufacturing Overhead Control 30,000
   Wages Payable Control 30,000
D) Wages Payable Control 30,000
   Work-in-Process Control 30,000
Answer: B
Diff: 2
Terms: job-costing system
Objective: 6
AACSB: Analytical skills
16) Manufacturing overhead costs incurred for the month are:

- Utilities $30,000
- Depreciation on equipment $25,000
- Repairs $20,000

Which is the correct journal entry assuming utilities and repairs were on account?

A) Manufacturing Overhead Control  75,000  
   Accounts Payable Control  50,000  
   Accumulated Depreciation Control 25,000

B) Manufacturing Overhead Control  75,000  
   Accounts Payable Control  75,000

C) Manufacturing Overhead Control  75,000  
   Accumulated Depreciation Control 75,000

D) Accumulated Depreciation Control  25,000  
   Accounts Payable Control  50,000  
   Manufacturing Overhead Control  75,000

Answer:  A  
Diff: 2

Terms:  job-costing system  
Objective:  6

AACSBS:  Analytical skills

17) Which of the following statements regarding manufacturing overhead allocation is FALSE?

A) It includes all manufacturing costs that cannot be directly traced to a product or service.  
B) The costs can be grouped in either a single indirect-cost pool or in multiple indirect-cost pools.  
C) Total costs are unknown at the end of the accounting period.  
D) Allocated amounts are debited to Work-in-Process.

Answer:  C  
Diff: 2

Terms:  manufacturing overhead allocated  
Objective:  6

AACSBS:  Reflective thinking

18) When a job is complete:

A) Work-in-Process Control is debited  
B) Finished Goods Control is credited  
C) the cost of the job is transferred to Manufacturing Overhead Control  
D) actual direct materials, actual direct manufacturing labor, and allocated manufacturing overhead will comprise the total cost of the job

Answer:  D  
Diff: 2

Terms:  job-costing system  
Objective:  6

AACSBS:  Reflective thinking
19) During an accounting period, job costs are computed on an ongoing basis by the use of:
A) actual allocation rates
B) budgeted indirect-cost rates
C) overallocated indirect-cost rates
D) underallocated indirect-cost rates
Answer: B
Diff: 1
Terms: budgeted indirect-cost rate
Objective: 6
AACSB: Use of Information Technology

20) The advantage of using normal costing instead of actual costing is:
A) indirect costs are assigned at the end of the year when they are known
B) the job cost is more accurate under normal costing
C) indirect costs are assigned to a job on a timely basis
D) normal costing provides a higher gross profit margin
Answer: C
Diff: 1
Terms: actual costing, normal costing
Objective: 6
AACSB: Reflective thinking

Answer the following questions using the information below:

Joni's Kitty Supplies applies manufacturing overhead costs to products at a budgeted indirect-cost rate of $60 per direct manufacturing labor-hour. A retail outlet has requested a bid on a special order of the Toy Mouse product. Estimates for this order include: Direct materials $40,000; 500 direct manufacturing labor-hours at $20 per hour; and a 20% markup rate on total manufacturing costs.

21) Estimated total product costs for this special order equal:
A) $96,000
B) $50,000
C) $80,000
D) None of these answers is correct.
Answer: C
Explanation: C) DM $40,000 + DML (500 × $20) + MOH $30,000 = $80,000
Diff: 2
Terms: normal costing
Objective: 6
AACSB: Analytical skills
22) The bid price for this special order is:
A) $50,000
B) $60,000
C) $80,000
D) $96,000
Answer: D
Explanation: D) (DU $40,000 + DML (500 × $20) + MOH 30,000) × 120% = $96,000
Diff: 2
Terms: normal costing
Objective: 6
AACSB: Analytical skills

Answer the following questions using the information below:

Philadelphia Company manufactures pipes and applies manufacturing overhead costs to production at a
budgeted indirect-cost rate of $15 per direct labor-hour. The following data are obtained from the
accounting records for June 2010:

- Direct materials $140,000
- Direct labor (3,500 hours @ $11/hour) $38,500
- Indirect labor $10,000
- Plant facility rent $30,000
- Depreciation on plant machinery and equipment $15,000
- Sales commissions $20,000
- Administrative expenses $25,000

23) The amount of manufacturing overhead allocated to all jobs during June 2010 totals:
A) $38,500
B) $52,500
C) $55,000
D) $100,000
Answer: B
Explanation: B) 3,500 × $15 per dlh = $52,500
Diff: 2
Terms: manufacturing overhead allocated
Objective: 6
AACSB: Analytical skills

24) For June 2010, manufacturing overhead was:
A) overallocated
B) underallocated
C) neither overallocated nor underallocated
D) indeterminable
Answer: B
Explanation: B) Underallocated: Allocated only $52,500 (3,500 × $15 per dlh) of the $55,000 actual
overhead
Diff: 2
Terms: underallocated indirect costs
Objective: 6
AACSB: Analytical skills
Bauer Manufacturing uses departmental cost driver rates to allocate manufacturing overhead costs to products. Manufacturing overhead costs are allocated on the basis of machine-hours in the Machining Department and on the basis of direct labor-hours in the Assembly Department. At the beginning of 20X3, the following estimates were provided for the coming year:

<table>
<thead>
<tr>
<th></th>
<th>Machining</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor-hours</td>
<td>30,000</td>
<td>60,000</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>80,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Direct labor cost</td>
<td>$500,000</td>
<td>$900,000</td>
</tr>
<tr>
<td>Manufacturing overhead costs</td>
<td>$420,000</td>
<td>$240,000</td>
</tr>
</tbody>
</table>

The accounting records of the company show the following data for Job #316:

<table>
<thead>
<tr>
<th></th>
<th>Machining</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor-hours</td>
<td>120</td>
<td>70</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>60</td>
<td>5</td>
</tr>
<tr>
<td>Direct material cost</td>
<td>$300</td>
<td>$200</td>
</tr>
<tr>
<td>Direct labor cost</td>
<td>$100</td>
<td>$400</td>
</tr>
</tbody>
</table>

25) For Bauer Manufacturing, what is the annual manufacturing overhead cost-allocation rate for the Machining Department?
A) $4.00  
B) $4.20  
C) $4.67  
D) $5.25  
Answer: D  
Explanation: D) $420,000/80,000 mh = $5.25 per mh  
Diff: 2  
Terms: indirect-cost rate  
Objective: 6  
AACSB: Analytical skills

26) What amount of manufacturing overhead costs will be allocated to Job #316?
A) $439  
B) $502  
C) $595  
D) $532  
Answer: C  
Explanation: C) ($420,000 / 80,000 mh × 60 mh) + [($240,000/60,000) × 70 dlh] = $595  
Diff: 3  
Terms: manufacturing overhead allocated  
Objective: 6  
AACSB: Analytical skills
27) What are the total manufacturing costs of Job #316?
A) $715
B) $880
C) $1,595
D) $1,000
Answer: C
Explanation: C) DM $500 + DML $500 + MOH $595 = $1,595
Diff: 3
Terms: manufacturing overhead allocated
Objective: 6
AACSB: Analytical skills

Answer the following questions using the information below:

Wayland Manufacturing uses a normal cost system and had the following data available for 2010:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials purchased on account</td>
<td>$148,000</td>
</tr>
<tr>
<td>Direct materials requisitioned</td>
<td>82,000</td>
</tr>
<tr>
<td>Direct labor cost incurred</td>
<td>130,000</td>
</tr>
<tr>
<td>Factory overhead incurred</td>
<td>146,000</td>
</tr>
<tr>
<td>Cost of goods completed</td>
<td>292,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>256,000</td>
</tr>
<tr>
<td>Beginning direct materials inventory</td>
<td>26,000</td>
</tr>
<tr>
<td>Beginning WIP inventory</td>
<td>64,000</td>
</tr>
<tr>
<td>Beginning finished goods inventory</td>
<td>58,000</td>
</tr>
<tr>
<td>Overhead application rate, as a percent of direct-labor costs</td>
<td>125 percent</td>
</tr>
</tbody>
</table>

28) The journal entry to record the materials placed into production would include a:
A) credit to Direct Materials Inventory for $82,000
B) debit to Direct Materials Inventory for $148,000
C) credit to WIP Inventory for $82,000
D) debit to WIP Inventory for $148,000
Answer: A
Diff: 2
Terms: job-costing system
Objective: 6
AACSB: Analytical skills
29) The ending balance of direct materials inventory is:
A) $92,000
B) $174,000
C) $82,000
D) $108,000
Answer: A
Explanation: A) $26,000 + $148,000 - $82,000 = $92,000
Diff: 2
Terms: job-costing system
Objective: 6
AACSB: Analytical skills

30) The ending balance of work-in-process inventory is:
A) $438,500
B) $146,500
C) $130,000
D) $422,000
Answer: B
Explanation: B) $64,000 + $82,000 + $130,000 + 1.25 ($130,000) - 292,000 = $146,500
Diff: 3
Terms: job-costing system
Objective: 6
AACSB: Analytical skills

31) The ending balance of finished goods inventory is:
A) $58,000
B) $36,000
C) $94,000
D) $292,000
Answer: C
Explanation: C) $58,000 + $292,000 - $256,000 = $94,000
Diff: 3
Terms: job-costing system
Objective: 6
AACSB: Analytical skills
Answer the following questions using the information below:

Apple Valley Corporation uses a job cost system and has two production departments, A and B. Budgeted manufacturing costs for the year are:

<table>
<thead>
<tr>
<th></th>
<th>Department A</th>
<th>Department B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$700,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>$200,000</td>
<td>$800,000</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>$600,000</td>
<td>$400,000</td>
</tr>
</tbody>
</table>

The actual material and labor costs charged to Job #432 were as follows:

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials:</td>
<td>$25,000</td>
</tr>
<tr>
<td>Direct labor:</td>
<td></td>
</tr>
<tr>
<td>Department A</td>
<td>$8,000</td>
</tr>
<tr>
<td>Department B</td>
<td>$12,000</td>
</tr>
<tr>
<td></td>
<td>$20,000</td>
</tr>
</tbody>
</table>

Apple Valley applies manufacturing overhead costs to jobs on the basis of direct manufacturing labor cost using departmental rates determined at the beginning of the year.

32) Manufacturing costs estimated for Job #432 total:
A) $55,000
B) $65,000
C) $70,000
D) $75,000
Answer: D
Explanation: D) DM $25,000 + DML $20,000 + MOH $30,000 [($8,000 × $600,000 / $200,000)] + [$12,000 × $400,000/$800,000] = $75,000
Diff: 3
Terms: manufacturing overhead allocated
Objective: 6
AACSB: Analytical skills

33) Work-in-Process Control will be decreased (credited) for the amount of direct-labor costs incurred.
Answer: FALSE
Explanation: Work-in-Process Control will be increased (debited) for the amount of direct-labor costs incurred.
Diff: 1
Terms: job-costing system
Objective: 6
AACSB: Reflective thinking
34) The Work-in-Process Control account tracks job costs from the time jobs are started until they are completed.
Answer: TRUE
Diff: 2
Terms: job-costing system
Objective: 6
AACSB: Reflective thinking

35) Purchases of materials are credited to materials control.
Answer: FALSE
Explanation: Purchases of materials are debited to materials control.
Diff: 1
Terms: job-costing system
Objective: 6
AACSB: Reflective thinking

36) The Salaries Payable Control account has underlying subsidiary ledgers.
Answer: TRUE
Diff: 1
Terms: job-costing system
Objective: 6
AACSB: Reflective thinking

37) Indirect materials that are requisitioned increase the Materials Control account.
Answer: FALSE
Explanation: Indirect materials that are requisitioned increase the Manufacturing Overhead Control account.
Diff: 1
Terms: job-costing system
Objective: 6
AACSB: Reflective thinking

38) In a job-cost system, each indirect-cost pool has its own account in the general ledger.
Answer: TRUE
Diff: 2
Terms: job-costing system, cost pool
Objective: 6
AACSB: Reflective thinking

39) Indirect manufacturing costs are debited to Manufacturing Overhead Control.
Answer: TRUE
Diff: 1
Terms: indirect manufacturing costs
Objective: 6
AACSB: Reflective thinking
40) The Finished Goods Control account consists of actual manufacturing overhead costs rather than allocated manufacturing overhead costs.
Answer: FALSE
Explanation: The Finished Goods Control account consists of *allocated* manufacturing overhead costs rather than actual manufacturing overhead costs.

Diff: 2
Terms: job-costing system
Objective: 6
AACSB: Reflective thinking

41) The ending balance in Work-in-Process Control represents the total costs of all jobs that have NOT yet been completed.
Answer: TRUE

Diff: 1
Terms: job-costing system
Objective: 6
AACSB: Reflective thinking

42) The product cost reported as inventoriable costs to shareholders may differ from product costs reported for government contracting.
Answer: TRUE

Diff: 1
Terms: product costs, inventoriable costs
Objective: 6
AACSB: Ethical reasoning

43) For external reporting purposes, it is acceptable to allocate marketing costs to individual jobs.
Answer: FALSE
Explanation: Management may choose to allocate marketing costs to individual jobs for internal *pricing, product-mix, and cost-management decisions*.

Diff: 2
Terms: job-costing system
Objective: 6
AACSB: Ethical reasoning
44) Jordan Company has two departments, X and Y. Overhead is applied based on direct labor cost in Department X and machine-hours in Department Y. The following additional information is available:

<table>
<thead>
<tr>
<th>Budgeted Amounts</th>
<th>Department X</th>
<th>Department Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor cost</td>
<td>$180,000</td>
<td>$165,000</td>
</tr>
<tr>
<td>Factory overhead</td>
<td>$225,000</td>
<td>$180,000</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>51,000 mh</td>
<td>40,000 mh</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Actual data for Job #10</th>
<th>Department X</th>
<th>Department Y</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials requisitioned</td>
<td>$10,000</td>
<td>$16,000</td>
</tr>
<tr>
<td>Direct labor cost</td>
<td>$11,000</td>
<td>$14,000</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>5,000 mh</td>
<td>3,000 mh</td>
</tr>
</tbody>
</table>

**Required:**

a. Compute the budgeted factory overhead rate for Department X.
b. Compute the budgeted factory overhead rate for Department Y.
c. What is the total overhead cost of Job 10?
d. If Job 10 consists of 50 units of product, what is the unit cost of this job?

**Answer:**

a. $225,000/$180,000 = 125%
b. $180,000/40,000 hrs. = $4.50 per hour
c. ($11,000 × 125 percent) + ($4.50 × 3,000 hrs.) = $27,250
d. $10,000 + $16,000 + $11,000 + $14,000 + $27,250 = $78,250/50 units = $1,565 per unit

Diff: 2
Terms: job costing system
Objective: 4, 6
AACSB: Analytical skills

45) Job-cost records for Boucher Company contained the following data:

<table>
<thead>
<tr>
<th>Job No.</th>
<th>Date Started</th>
<th>Date Finished</th>
<th>Date Sold</th>
<th>Total Cost of Job at June 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>220</td>
<td>May 18</td>
<td>June 12</td>
<td>June 20</td>
<td>$6,000</td>
</tr>
<tr>
<td>221</td>
<td>May 20</td>
<td>June 19</td>
<td>June 21</td>
<td>4,000</td>
</tr>
<tr>
<td>222</td>
<td>June 7</td>
<td>July 5</td>
<td>July 12</td>
<td>7,000</td>
</tr>
<tr>
<td>223</td>
<td>June 10</td>
<td>June 28</td>
<td>July 1</td>
<td>6,500</td>
</tr>
<tr>
<td>224</td>
<td>June 19</td>
<td>July 16</td>
<td>July 25</td>
<td>8,000</td>
</tr>
</tbody>
</table>

**Required:**

a. Compute WIP inventory at June 30.
b. Compute finished goods inventory at June 30.
c. Compute cost of goods sold for June.

**Answer:**

a. $7,000 + $8,000 = $15,000
b. $6,500
c. $6,000 + $4,000 = $10,000

Diff: 2
Terms: job costing system
Objective: 4, 6
AACSB: Analytical skills
46) Constanza Company has the following balances as of the year ended December 31, 2010

<table>
<thead>
<tr>
<th>Account</th>
<th>Balance</th>
<th>Dr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Materials Inventory</td>
<td>$30,000</td>
<td></td>
</tr>
<tr>
<td>WIP Inventory</td>
<td>$69,000</td>
<td></td>
</tr>
<tr>
<td>Finished Goods Inventory</td>
<td>$99,000</td>
<td></td>
</tr>
<tr>
<td>Underapplied Factory Department Overhead</td>
<td>$8,000</td>
<td></td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td>$149,000</td>
<td></td>
</tr>
</tbody>
</table>

Additional information is as follows:

- Cost of direct materials purchased during 2010: $82,000
- Cost of direct materials requisitioned in 2010: $74,000
- Cost of goods completed during 2010: $204,000
- Factory overhead applied (120% of direct labor): $96,000

**Required:**

a. Compute beginning direct materials inventory.
b. Compute beginning WIP inventory.
c. Compute beginning finished goods inventory.
d. Compute actual factory overhead incurred.

**Answer:**

a. \[ \text{Beg Inv} + \$82,000 - \$74,000 = \$30,000 \]
   \[ \text{Beg Inv} = \$22,000 \]
b. \[ \$96,000/120\% = \$80,000 \text{ direct labor costs incurred} \]
   \[ \$204,000 - \$74,000 - \$80,000 - \$96,000 + \$69,000 = 23,000 \]
c. \[ \$149,000 - \$204,000 + \$99,000 = \$44,000 \]
d. \[ \$96,000 + \$8,000 = \$104,000 \]

**Diff:** 3

**Terms:** job costing system

**Objective:** 4, 6

**AACSB:** Analytical skills
47) Cowley County Hospital uses a job-costing system for all patients who have surgery. In March, the pre-operating room (PRE-OP) and operating room (OR) had budgeted allocation bases of 4,000 nursing hours and 2,000 nursing hours, respectively. The budgeted nursing overhead charges for each department for the month were $168,000 and $132,000, respectively. The hospital floor for surgery patients had budgeted overhead costs of $1,200,000 and 15,000 nursing hours for the month. For patient Fred Adams, actual hours incurred were eight and four hours, respectively, in the PRE-OP and OR rooms. He was in the hospital for 4 days (96 hours). Other costs related to Adams were:

<table>
<thead>
<tr>
<th></th>
<th>PRE-OP</th>
<th>OR</th>
<th>In-room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient medicine</td>
<td>$200</td>
<td>$500</td>
<td>$2,400</td>
</tr>
<tr>
<td>Direct nursing time</td>
<td>$1,000</td>
<td>$2,000</td>
<td>$3,000</td>
</tr>
</tbody>
</table>

The hospital uses a budgeted overhead rate for applying overhead to patient stays.

**Required:**
What is the total cost of the stay of patient Fred Adams?

**Answer:**
Nursing overhead rate PRE-OP = $168,000/4,000 hrs.  
= $42 per hr.

Nursing overhead rate OR = $132,000/2,000 hrs.  
= $66 per hr.

Overhead rate for surgery floor = $1,200,000/15,000 hrs.  
= $80 per hr.

**Patient Fred Adams:**

<table>
<thead>
<tr>
<th></th>
<th>PRE-OP</th>
<th>OR</th>
<th>In-room</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient medicine</td>
<td>$200</td>
<td>$500</td>
<td>$2,400</td>
<td>$3,100</td>
</tr>
<tr>
<td>Direct nursing time</td>
<td>1,000</td>
<td>2,000</td>
<td>3,000</td>
<td>6,000</td>
</tr>
<tr>
<td>Nursing overhead:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PRE-OP ($42 × 8)</td>
<td>336</td>
<td></td>
<td></td>
<td>336</td>
</tr>
<tr>
<td>OR ($66 × 4)</td>
<td>264</td>
<td></td>
<td></td>
<td>264</td>
</tr>
<tr>
<td>In-room ($80 × 96)</td>
<td>0</td>
<td>0</td>
<td>7,680</td>
<td>7,680</td>
</tr>
<tr>
<td>Total</td>
<td>$1,536</td>
<td>$2,764</td>
<td>$13,080</td>
<td>$17,380</td>
</tr>
</tbody>
</table>

Diff: 3  
Terms: budgeted indirect-cost rate  
Objective: 4, 6  
AACSB: Analytical skills
48) The Dougherty Furniture Company manufactures tables. In March, the two production departments had budgeted allocation bases of 4,000 machine-hours in Department 100 and 8,000 direct manufacturing labor-hours in Department 200. The budgeted manufacturing overheads for the month were $57,500 and $62,500, respectively. For Job A, the actual costs incurred in the two departments were as follows:

<table>
<thead>
<tr>
<th>Department 100</th>
<th>Department 200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials purchased on account</td>
<td>$110,000</td>
</tr>
<tr>
<td>Direct materials used</td>
<td>32,500</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>52,500</td>
</tr>
<tr>
<td>Indirect manufacturing labor</td>
<td>11,000</td>
</tr>
<tr>
<td>Indirect materials used</td>
<td>7,500</td>
</tr>
<tr>
<td>Lease on equipment</td>
<td>16,250</td>
</tr>
<tr>
<td>Utilities</td>
<td>1,000</td>
</tr>
</tbody>
</table>

Job A incurred 800 machine-hours in Department 100 and 300 manufacturing labor-hours in Department 200. The company uses a budgeted overhead rate for applying overhead to production.

**Required:**

a. Determine the budgeted manufacturing overhead rate for each department.
b. Prepare the necessary journal entries to summarize the March transactions for Department 100.
c. What is the total cost of Job A?

**Answer:**

a. Manufacturing overhead rate Department 100 = $57,500/4,000 hours = $14.375 per machine-hour

Manufacturing overhead rate Department 200 = $62,500/8,000 hours = $7.8125 per labor-hour

b. Materials Control Department 100
   Accounts Payable Control 110,000
   Work-in-Process Control Department 100 32,500
   Manufacturing Overhead Control Department 100 7,500
   Materials Control Department 100 40,000

   Work-in-Process Control Department 100 52,500
   Manufacturing Overhead Control Department 100 11,000
   Wages Payable Control 63,500

   Manufacturing Overhead Control Department 100 17,250
   Leaseholds Payable Control 16,250
   Utilities Payable Control 1,000

   Work-in-Process Control Dept. 100 ($14.375 × 800 hrs)11,500
   Manufacturing Overhead Allocated 11,500
c. **Job A:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials Dept. 100</td>
<td>$32,500</td>
</tr>
<tr>
<td>Direct materials Dept. 200</td>
<td>13,500</td>
</tr>
<tr>
<td>Direct manufacturing labor Dept. 100</td>
<td>52,500</td>
</tr>
<tr>
<td>Direct manufacturing labor Dept. 200</td>
<td>53,500</td>
</tr>
<tr>
<td>Manufacturing overhead Dept. 100 ($14.375 x 800)</td>
<td>11,500</td>
</tr>
<tr>
<td>Manufacturing overhead Dept. 200 ($7.8125 x 300)</td>
<td>2,344</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$165,844</strong></td>
</tr>
</tbody>
</table>

Diff: 3  
Terms: budgeted indirect-cost rate  
Objective: 6  
AACSB: Analytical skills

49) In a job-costing system, explain why it is necessary to apply indirect costs to production through the use of a manufacturing overhead cost allocation rate.

Answer: First, actual manufacturing overhead costs are not known until the end of year. To price and invoice jobs in a timely manner, annual manufacturing overhead costs need to be estimated and allocated to specific jobs during the accounting period. Secondly, manufacturing overhead costs are usually not incurred evenly throughout the year. The use of a manufacturing overhead cost allocation rate evenly distributes manufacturing overhead costs over the entire year.

Diff: 2  
Terms: budgeted indirect-cost rate  
Objective: 3, 4, 5, 6  
AACSB: Reflective thinking

50) Why does the manufacturing overhead control account (debit) need to equal the manufacturing overhead allocated account (credit)?

Answer: If these accounts do not equal, then overhead has either been overallocated or underallocated. Either situation means that the cost of the cost object has not been correctly estimated during the period. Evaluation of profitability will be incorrect depending on the materiality of the difference between the two accounts.

Diff: 2  
Terms: manufacturing overhead costs  
Objective: 6  
AACSB: Analytical skills
51) What are three possible ways to dispose of underallocated or overallocated overhead costs at the end of a fiscal year? Briefly comment on the theoretical correctness or incorrectness of each method.

Answer: One way to dispose of underallocated or overallocated overhead costs at the end of a fiscal year would be to prorate the underallocated or overallocated overhead costs to the work-in-process control account, the finished goods control account, and to the cost of goods sold account based on the relative amounts in each account. This is a theoretically correct method since it is reasonable to believe that the underallocated or overallocated overhead costs should attach themselves to the goods as they are produced. A second way to dispose of the underallocated or overallocated overhead costs at the end of a fiscal year would be to adjust the allocation rate based on the actual amounts and reallocate the overhead to completed jobs. This is also a theoretically correct method. A third way is to clear all underallocated or overallocated overhead to the cost of goods sold account. This is not theoretically valid but it is practical if the amount of underallocated or overallocated overhead is not material.

Diff: 2

Terms: proration, manufacturing overhead applied

Objective: 6

AACSB: Reflective thinking

Objective 4.7

1) The spreading of underallocated or overallocated overhead among ending work-in-process, finished goods, and cost of goods sold is called:
A) the adjusted allocation rate approach
B) the proration approach
C) the write-off of cost of goods sold approach
D) None of these answers are correct.

Answer: B

Diff: 1

Terms: proration

Objective: 7

AACSB: Reflective thinking

2) The method that restates all overhead entries in the general ledger and subsidiary ledgers using actual cost rates rather than budgeted cost rates is called:
A) the adjusted allocation rate approach
B) the proration approach
C) the write-off of cost of goods sold approach
D) None of these answers are correct.

Answer: A

Diff: 1

Terms: proration

Objective: 7

AACSB: Reflective thinking
3) When the allocated amount of indirect costs are less than the actual amount, indirect costs have been:
   A) overabsorbed
   B) underapplied
   C) underallocated
   D) Both underapplied and underallocated are correct.
   Answer:  D
   Diff: 2
   Terms:  underallocated indirect costs, underapplied indirect costs
   Objective:  7
   AACSB:  Reflective thinking

4) One reason indirect costs may be overapplied is because:
   A) the actual allocation base quantity exceeds the budgeted quantity
   B) budgeted indirect costs exceed actual indirect costs
   C) requisitioned direct materials exceed budgeted material costs
   D) Both A and B are correct.
   Answer:  B
   Diff: 3
   Terms:  overapplied indirect costs
   Objective:  7
   AACSB:  Analytical skills

5) The _______ approach adjusts individual job-cost records to account for underallocated or
   overallocated overhead.
   A) adjusted allocation-rate
   B) proration
   C) write-off to cost of goods sold
   D) Both A and B are correct.
   Answer:  A
   Diff: 1
   Terms:  adjusted allocation-rate approach
   Objective:  7
   AACSB:  Reflective thinking

6) The adjusted allocation approach yields the benefits of:
   A) timeliness and convenience of normal costing
   B) allocation of of actual manufacturing overhead costs at the end of the year
   C) Both a and b are correct.
   D) Neither a nor b are correct.
   Answer:  C
   Diff: 1
   Terms:  actual costing, normal costing
   Objective:  7
   AACSB:  Reflective thinking
7) The approach often used when dealing with small amounts of underallocated or overallocated overhead is the ________ approach.
   A) adjusted allocation-rate
   B) proration
   C) write-off to cost of goods sold
   D) Both A and B are correct.
   Answer: C
   Diff: 1
   Terms: overallocated indirect costs, underallocated indirect costs
   Objective: 7
   AACSB: Reflective thinking

8) The ________ approach carries the underallocated or overallocated amounts to overhead accounts in the following year.
   A) adjusted allocation-rate
   B) proration
   C) write-off to cost of goods sold
   D) None of these answers are correct.
   Answer: D
   Diff: 2
   Terms: overallocated indirect costs, underallocated indirect costs
   Objective: 7
   AACSB: Reflective thinking

9) A company would use multiple cost-allocation bases:
   A) if managers believed the benefits exceeded the additional costs of that costing system
   B) because there is more than one way to allocate overhead
   C) because this is a simpler approach than using one cost allocation base
   D) if managers believe that using multiple cost-allocation bases is the only acceptable method
   Answer: A
   Diff: 2
   Terms: multiple overhead cost pools
   Objective: 7
   AACSB: Ethical reasoning
Because the Abernathy Company used a budgeted indirect-cost rate for its manufacturing operations, the amount allocated ($200,000) was different from the actual amount incurred ($225,000).

10) What is the journal entry used to write off the difference between allocated and actual overhead directly to cost of goods sold?

A) Manufacturing Overhead Allocated 200,000
   Cost of Goods Sold 25,000
   Manufacturing Overhead Control 225,000

B) Manufacturing Overhead Control 200,000
   Cost of Goods Sold 25,000
   Manufacturing Overhead Allocated 225,000

C) Manufacturing Overhead Allocated 200,000
   Work-in-Process Control 30,000
   Cost of Goods Sold 170,000

D) Manufacturing Overhead Control 225,000
   Work-in-Process Control 55,000
   Cost of Goods Sold 170,000

Answer: A
Diff: 2
Terms: overapplied indirect costs, underapplied indirect costs
Objective: 7
AACSB: Analytical skills
11) What is the journal entry used to write off the difference between allocated and actual overhead using the proration approach?

A) Manufacturing Overhead Allocated 200,000
   Work-in-Process Control 10,000
   Finished Goods Control 20,000
   Manufacturing Overhead Control 230,000

B) Manufacturing Overhead Allocated 225,000
   Work-in-Process Control 1,250
   Finished Goods Control 2,500
   Cost of Goods Sold 21,250
   Manufacturing Overhead Control 200,000

C) Manufacturing Overhead Control 225,000
   Work-in-Process Control 1,250
   Finished Goods Control 2,500
   Cost of Goods Sold 21,250
   Manufacturing Overhead Allocated 200,000

D) Manufacturing Overhead Allocated 200,000
   Work-in-Process Control 1,250
   Finished Goods Control 2,500
   Cost of Goods Sold 21,250
   Manufacturing Overhead Control 225,000

Answer: D

Explanation:

D) Work-in-process $ 10,000 5% x $25,000 = $1,250
    Finished goods 20,000 10% x 25,000 = 2,500
    Cost of goods sold 170,000 85% x 25,000 = 21,250

  $200,000 100% $25,000

Diff: 2
Terms: proration
Objective: 7
AACSB: Analytical skills
Roiann and Dennett Law Office employs 12 full-time attorneys and 10 paraprofessionals. Direct and indirect costs are applied on a professional labor-hour basis that includes both attorney and paraprofessional hours. Following is information for 20X3:

<table>
<thead>
<tr>
<th></th>
<th>Budget</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indirect costs</td>
<td>$270,000</td>
<td>$300,000</td>
</tr>
<tr>
<td>Annual salary of each attorney</td>
<td>$100,000</td>
<td>$110,000</td>
</tr>
<tr>
<td>Annual salary of each paraprofessional</td>
<td>$ 29,000</td>
<td>$ 30,000</td>
</tr>
<tr>
<td>Total professional labor-hours</td>
<td>50,000 dlh</td>
<td>60,000 dlh</td>
</tr>
</tbody>
</table>

12) When using a normal costing system, year-end accounting records will show that indirect costs are:
A) applied improperly
B) underallocated
C) overbudgeted
D) overallocated
Answer: D
Explanation: D) Overallocated: Allocated $324,000 ($270,000 / 50,000 × 60,000 dlh) when actual is only $300,000
Diff: 3
Terms: normal costing
Objective: 7
AACSB: Reflective thinking

13) Overhead costs allocated each month are expected to equal actual overhead costs incurred each month.
Answer: FALSE
Explanation: Seasonal fluctuations and lump-sum payments for items such as property taxes are not expected to be incurred evenly throughout the year.
Diff: 2
Terms: manufacturing overhead allocated
Objective: 7
AACSB: Reflective thinking

14) When actual indirect costs exceed allocated indirect costs, indirect costs have been underapplied.
Answer: TRUE
Diff: 1
Terms: overapplied indirect costs
Objective: 7
AACSB: Analytical skills

15) One reason indirect costs may be underapplied is if actual indirect costs are less than budgeted indirect costs.
Answer: FALSE
Diff: 3
Terms: overapplied indirect costs, underapplied indirect costs
Objective: 7
AACSB: Analytical skills
16) The proration approach to allocating overapplied or underapplied overhead adjusts individual job-cost records.
Answer: FALSE
Explanation: The proration approach to allocating overapplied or underapplied overhead adjusts only general ledger accounts and not subsidiary ledgers or individual job-cost records.
Diff: 2
Terms: proration, overapplied indirect costs, underapplied indirect costs
Objective: 7
AACSB: Analytical skills

17) The overhead accounts are closed or become zero at the end of each year.
Answer: TRUE
Diff: 1
Terms: job-costing system
Objective: 7
AACSB: Reflective thinking

18) Overallocated indirect costs occur when the allocated amount of indirect costs is greater than the amount incurred for that period.
Answer: TRUE
Diff: 2
Terms: underallocated indirect costs
Objective: 7
AACSB: Reflective thinking

19) The actual costs of all individual overhead categories are recorded in the Manufacturing Overhead Control account.
Answer: TRUE
Diff: 1
Terms: job-costing system
Objective: 7
AACSB: Analytical skills

20) Proration is the spreading of underallocated or overallocated overhead among ending work in process, finished goods, and costs of goods sold.
Answer: TRUE
Diff: 1
Terms: proration
Objective: 7
AACSB: Reflective thinking

21) It is inappropriate for service organizations such as public accounting firms to use job costing.
Answer: FALSE
Explanation: Accounting firms, law firms, and other firms in the service industry can use Job costing.
Diff: 1
Terms: job-costing system
Objective: 7
AACSB: Ethical reasoning
22) Pumpkin Plastic Products Company manufactures pipes and applies manufacturing costs to production at a budgeted indirect-cost rate of $9 per direct labor-hour. The following data are obtained from the accounting records for June 2010:

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$300,000</td>
</tr>
<tr>
<td>Direct labor (16,000 hours @ $11/hour)</td>
<td>$44,000</td>
</tr>
<tr>
<td>Indirect labor</td>
<td>$20,000</td>
</tr>
<tr>
<td>Plant facility rent</td>
<td>$100,000</td>
</tr>
<tr>
<td>Depreciation on plant machinery and equipment</td>
<td>$40,000</td>
</tr>
<tr>
<td>Sales commissions</td>
<td>$30,000</td>
</tr>
<tr>
<td>Administrative expenses</td>
<td>$40,000</td>
</tr>
</tbody>
</table>

**Required:**
a. What actual amount of manufacturing overhead costs was incurred during June 2010?
b. What amount of manufacturing overhead was allocated to all jobs during June 2010?  
c. For June 2010, was manufacturing overhead underallocated or overallocated? Explain.

**Answer:**
a. $20,000 + $100,000 + $40,000 = $160,000  
b. 16,000 × $9 per dlh = $144,000  
c. Underallocated by $16,000: Only allocated $144,000 of the $160,000 of actual overhead

**Diff:** 2  
**Terms:** manufacturing overhead allocated  
**Objective:** 7  
**AACSB:** Analytical skills
23) Moira Company has just finished its first year of operations and must decide which method to use for adjusting cost of goods sold. Because the company used a budgeted indirect-cost rate for its manufacturing operations, the amount that was allocated ($435,000) to cost of goods sold was different from the actual amount incurred ($425,000).

Ending balances in the relevant accounts were:

<table>
<thead>
<tr>
<th>Account</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work-in-Process</td>
<td>$40,000</td>
</tr>
<tr>
<td>Finished Goods</td>
<td>80,000</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td>680,000</td>
</tr>
</tbody>
</table>

**Required:**

a. Prepare a journal entry to write off the difference between allocated and actual overhead directly to Cost of Goods Sold. Be sure your journal entry closes the related overhead accounts.

b. Prepare a journal entry that prorates the write-off of the difference between allocated and actual overhead using ending account balances. Be sure your journal entry closes the related overhead accounts.

**Answer:**

a. Manufacturing Overhead Allocated 435,000
   Cost of Goods Sold 10,000
   Manufacturing Overhead Control 425,000

b. Work-in-process $40,000 5% × $10,000 = $500
   Finished goods 80,000 10% × $10,000 = 1,000
   Cost of goods sold 680,000 85% × $10,000 = 8,500
   Total $800,000 100%

   Manufacturing Overhead Allocated 435,000
   Work-in-Process 500
   Finished Goods 1,000
   Cost of Goods Sold 8,500
   Manufacturing Overhead Control 425,000

Diff: 3
Terms: manufacturing overhead allocated
Objective: 7
AACSB: Analytical skills
4) Jacobs Company manufactures refrigerators. The company uses a budgeted indirect-cost rate for its manufacturing operations and during 20X5 allocated $1,000,000 to work-in-process inventory. Actual overhead incurred was $1,100,000.

Ending balances in the following accounts are:
- Work-in-Process $100,000
- Finished Goods $750,000
- Cost of Goods Sold $4,150,000

**Required:**

a. Prepare a journal entry to write off the difference between allocated and actual overhead directly to Cost of Goods Sold. Be sure your journal entry closes the related overhead accounts.

b. Prepare a journal entry that prorates the write-off of the difference between allocated and actual overhead using ending account balances. Be sure your journal entry closes the related overhead accounts.

**Answer:**

a. Manufacturing Overhead Allocated $1,000,000
   - Cost of Goods Sold $100,000
   - Manufacturing Overhead Control $1,100,000

b. Work-in-process $100,000 2.0% × $100,000 = $2,000
   - Finished goods $750,000 15.0 × $100,000 = $15,000
   - Cost of goods sold $4,150,000 83.0 × $100,000 = $83,000
   - Total $5,000,000 100.0%

   Manufacturing Overhead Allocated $1,000,000
   - Work-in-Process $2,000
   - Finished Goods $15,000
   - Cost of Goods Sold $83,000
   - Manufacturing Overhead Control $1,100,000

**Diff:** 3

**Terms:** proration

**Objective:** 7

**AACSB:** Analytical skills
25) The following information was gathered for Jasmine Company for the year ended December 31, 2010

<table>
<thead>
<tr>
<th></th>
<th>Budgeted</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor-hours</td>
<td>75,000 dlh</td>
<td>80,000 dlh</td>
</tr>
<tr>
<td>Factory overhead</td>
<td>$600,000</td>
<td>$625,000</td>
</tr>
</tbody>
</table>

Assume that direct labor-hours are the cost-allocation base.

**Required:**

a. Compute the budgeted factory overhead rate.
b. Compute the factory overhead applied.
c. Compute the amount of over/underapplied overhead.

**Answer:**

a. \( \frac{$600,000}{75,000 \text{ hrs.}} = $8.00 \text{ per hour} \)
b. \( 8.00 \times 80,000 \text{ hrs.} = $640,000 \)
c. \( $640,000 - $625,000 = $15,000 \text{ overapplied} \)

**Diff:** 2

Terms: overapplied indirect costs, underapplied indirect costs

Objective: 7

AACSB: Analytical skills

26) Isabelle, Inc., uses a budgeted factory overhead rate to apply overhead to production. The following data are available for the year ended December 31, 20X5.

<table>
<thead>
<tr>
<th></th>
<th>Budgeted</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factory overhead</td>
<td>$675,000</td>
<td>$716,000</td>
</tr>
<tr>
<td>Direct labor costs</td>
<td>$450,000</td>
<td>$432,000</td>
</tr>
<tr>
<td>Direct labor-hours</td>
<td>12,500 dlh</td>
<td>13,325 dlh</td>
</tr>
</tbody>
</table>

**Required:**

a. Determine the budgeted factory overhead rate based on direct labor-hours.
b. What is the applied overhead based on direct labor-hours?
c. Is overhead overapplied or underapplied? Explain.

**Answer:**

a. \( \frac{$675,000}{12,500 \text{ hrs.}} = $54.00 \text{ per hour} \)
b. \( $54.00 \times 13,325 \text{ hrs.} = $719,550 \)
c. \( $716,000 - $719,550 = $3,550 \text{ overapplied} \)

**Diff:** 2

Terms: overapplied indirect costs, underapplied indirect costs

Objective: 7

AACSB: Analytical skills
27) Schulz Corporation applies overhead based upon machine-hours. Budgeted factory overhead was $266,400 and budgeted machine-hours were 18,500. Actual factory overhead was $287,920 and actual machine-hours were 19,050. Before disposition of under/overapplied overhead, the cost of goods sold was $560,000 and ending inventories were as follows:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$ 60,000</td>
</tr>
<tr>
<td>WIP</td>
<td>190,000</td>
</tr>
<tr>
<td>Finished goods</td>
<td>250,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$500,000</strong></td>
</tr>
</tbody>
</table>

**Required:**

a. Determine the budgeted factory overhead rate per machine-hour.
b. Compute the over/underapplied overhead.
c. Prepare the journal entry to dispose of the variance using the write-off to cost of goods sold approach.
d. Prepare the journal entry to dispose of the variance using the proration approach.

**Answer:**

a. $266,400/18,500 hrs. = $14.40 per hour

b. $14.40 \times 19,050 hours = $274,320 - $287,920 = $13,600 underapplied overhead

c. Cost of Goods Sold 13,600
   Factory Department Overhead Control 13,600

d. $560,000 + $190,000 + $250,000 = $1,000,000
   
   Cost of Goods Sold:
   $560,000/$1,000,000 = 56% \times $13,600 = $7,616
   
   WIP:
   $190,000/$1,000,000 = 19% \times $13,600 = $2,584
   
   Finished Goods:
   $250,000/$1,000,000 = 25% \times $13,600 = $3,400
   
   Cost of Goods Sold 7,616
   WIP Inventory 2,584
   Finished Goods Inventory 3,400
   Factory Department Overhead Control 13,600

**Diff**: 3

Terms: overapplied indirect costs, underapplied indirect costs

Objective: 7

AACSB: Analytical skills
28) Sedgwick County Hospital uses an indirect job-costing system for all patients. In June, the budgeted nursing care charges for each department and budgeted allocation bases of nursing days are as follows:

<table>
<thead>
<tr>
<th>June</th>
<th>Critical Care</th>
<th>Special Care</th>
<th>General Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted nursing costs</td>
<td>$2,480,000</td>
<td>$1,644,000</td>
<td>$1,280,400</td>
</tr>
<tr>
<td>Budgeted nursing days</td>
<td>5,000</td>
<td>4,000</td>
<td>8,000</td>
</tr>
</tbody>
</table>

Patient Ms. Graves spent six days in critical care and eight days in special care during June. The remainder of the 30-day month was spent in the general care area.

**Required:**

a. Determine the budgeted overhead rate for each department.

b. What are the total charges to Ms. Graves if she was in the facility the entire month?

**Answer:**

a. Overhead rate critical care = $2,480,000/5,000 nursing days = $496.00 per day.

Overhead rate special care = $1,644,000/4,000 nursing days = $411.00 per day

Overhead rate general = $1,280,400/8,000 nursing days = $160.05 per day

b. Ms. Graves:

Critical care: $496.00 × 6 days = $2,976.00

Special care: $411.00 × 8 days = $3,288.00

General care: $160.05 × 16 days = $2,560.80

Total overhead charges = $8,824.80

**Diff:** 2

Terms: indirect-cost rate

Objective: 7

AACSB: Analytical skills
29) Hammond and Jarrett provide tax consulting for estates and trusts. Their job-costing system has a single direct-cost category (professional labor) and a single indirect-cost pool (research support). The indirect-cost pool contains all the costs except direct personnel costs. All budgeted indirect costs are allocated to individual jobs using actual professional labor-hours.

Required:

a. Discuss the reasons a consulting firm might use a normal costing system rather than an actual costing system.

b. What might be some reasons for the firm to change from a one-pool to a multiple-pool allocation concept?

Answer:

a. Budget rates are normally used because actual costs may not be available until some time after a job is completed. Decisions about billing a client for services rendered generally must be made immediately after the job is completed. Also, actual costs may reflect short-run changes in the environment that may distort the billing process. Budgeted costs are affected by weekly or monthly fluctuations and, therefore, offer a stable comparison and assignment of costs throughout the accounting cycle.

b. Having separate professional labor-hour rates assists in assigning the personnel costs to jobs closest to their real values. This helps to maintain different costs for jobs that have the same number of hours but a different mix of professionals doing the job. Seldom is there only one cause-and-effect relationship between a job and the tasks performed on the job; therefore, it may also be a good idea to develop multiple indirect-cost assignments (i.e., one for staff support and others for such items as computer support or general administrative support).

Objective 4.8

1) In the service sector:

A) direct labor costs are always easy to trace to jobs
B) a budgeted direct-labor cost rate may be used to apply direct labor to jobs
C) normal costing may not be used
D) overhead is generally applied using an actual cost-allocation rate

Answer:  B

Terms:  budgeted indirect-cost rate
Objective:  8
AACSB:  Reflective thinking
2) In the service sector, to achieve timely reporting on the profitability of an engagement, a company will use:
A) budgeted rates for all direct costs
B) budgeted rates for indirect costs
C) actual costing
D) budgeted rates for some direct costs and indirect costs
Answer: D
Diff: 2
Terms: normal costing, budgeted direct cost rate, budgeted indirect cost rate
Objective: 8
AACSB: Reflective thinking

3) Luke employs 25 professional cleaners. Budgeted costs total $1,800,000 of which $1,050,000 is direct costs. Budgeted indirect costs are $750,000 and actual indirect costs were $793,800. Budgeted professional labor-hours are 1,000,000 and actual hours were 1,008,000. What is the budgeted direct cost-allocation rate?
A) $1.80 per hour
B) $1.7857 per hour
C) $0.75 per hour
D) $1.05 per hour
Answer: D
Explanation: D) $1,050,000 / 1,000,000 = $1.05
Diff: 2
Terms: budgeted direct cost rate
Objective: 8
AACSB: Analytical skills

4) The budgeted direct-labor cost rate includes ________ in the calculation.
A) budgeted total costs in indirect cost pool
B) budgeted total direct-labor costs in the denominator
C) budgeted total direct-labor costs in the numerator
D) budgeted total direct-labor hours in the numerator
Answer: C
Diff: 2
Terms: budgeted direct cost rate
Objective: 8
AACSB: Reflective thinking
5) The law firm of Smith & Jones has a staff of 30 lawyers and administrative staff. Budgeted total costs of the firm total $4,000,000 of which $2,500,000 is direct-labor costs. Assuming that the remaining costs are indirect and direct-labor cost is the allocation base, calculate the budgeted indirect cost rate.

A) 38% of direct-labor cost
B) 60% of direct-labor cost
C) 63% of direct-labor cost
D) 160% of direct-labor cost

Answer: B
Explanation: B) $1,500,000 / $2,500,000
Diff: 2
Terms: budgeted indirect-cost rate
Objective: 8
AACSB: Analytical skills

Answer the following questions using the information below:

A local accounting firm employs 20 full-time professionals. The budgeted annual compensation per employee is $40,500. The average chargeable time is 500 hours per client annually. All professional labor costs are included in a single direct-cost category and are allocated to jobs on a per-hour basis.

Other costs are included in a single indirect-cost pool, allocated according to professional labor-hours. Budgeted indirect costs for the year are $787,500, and the firm expects to have 90 clients during the coming year.

6) What is the budgeted direct labor cost rate per hour?
A) $18.00 per hour
B) $17.50 per hour
C) $4.05 per hour
D) $2,000 per hour

Answer: A
Explanation: A) Total direct labor cost = $40,500 \times 20 = $810,000
Total hours = 500 \times 90 = 45,000 hours
Direct labor cost rate per hour = $810,000 / 45,000 = $18.00 per hour
Diff: 2
Terms: budgeted indirect-cost rate
Objective: 8
AACSB: Analytical skills

7) What is the budgeted indirect-cost rate per hour?
A) $1,575.00 per hour
B) $78.75 per hour
C) $18.00 per hour
D) $17.50 per hour

Answer: D
Explanation: D) Indirect-cost rate per hour = $787,500 / 500 \times 90 = $17.50 per hour
Diff: 2
Terms: budgeted indirect-cost rate
Objective: 8
AACSB: Analytical skills
8) If ten clients are lost and the workforce stays at 20 employees, then the direct labor cost rate per hour:
A) will remain the same as before
B) will increase
C) will decrease
D) is indeterminable
Answer: B
Explanation:
B) Total direct cost = $40,500 × 30 = $810,000
Total hours = 200 × 80 = 40,000 hours
Direct cost rate per hour = $810,000 / 40,000 = $20.25 per hour
The direct labor cost rate per hour increased from $18.00 per hour to $20.25 per hour
Diff: 2
Terms: budgeted indirect-cost rate
Objective: 8
AACSB: Analytical skills

9) A company may choose to use budgeted rates to allocate direct labor accounts if direct labor costs are difficult to trace to jobs as they are completed.
Answer: TRUE
Diff: 1
Terms: budgeted indirect-cost rate
Objective: 8
AACSB: Reflective thinking

10) In some variations of normal costing, organizations use budgeted rates to assign direct costs as well as indirect costs to jobs.
Answer: TRUE
Diff: 2
Terms: normal costing
Objective: 8
AACSB: Reflective thinking

11) At the end of the year, the direct costs traced to jobs using the budgeted rates will equal actual direct costs.
Answer: FALSE
Explanation: The actual rate and budgeted rate are different because they are developed at different times.
Diff: 2
Terms: normal costing
Objective: 8
AACSB: Reflective thinking
12) Modern Electronics manufactures surround sound systems and applies manufacturing costs to production at a budgeted indirect-cost rate of $22 per direct-labor hour. The following data are obtained from the accounting records for August 20X9:

<table>
<thead>
<tr>
<th>Cost Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$350,000</td>
</tr>
<tr>
<td>Direct labor (7,000 hours @ $15/hour)</td>
<td>$105,000</td>
</tr>
<tr>
<td>Indirect labor</td>
<td>$ 15,000</td>
</tr>
<tr>
<td>Plant lease</td>
<td>$ 75,000</td>
</tr>
<tr>
<td>Depreciation on plant and equipment</td>
<td>$ 40,000</td>
</tr>
<tr>
<td>Marketing expense</td>
<td>$ 20,000</td>
</tr>
<tr>
<td>Plant utilities</td>
<td>$ 15,000</td>
</tr>
</tbody>
</table>

**Required:**

a. What actual amount of manufacturing overhead cost was incurred during August 20X9?

b. What amount of manufacturing overhead was allocated to all jobs during August 20X9?

c. For August 20X9, was manufacturing overhead underallocated or overallocated? Explain.

Answer:

a. $15,000 + $75,000 + $40,000 + $15,000 = $145,000
b. 7,000 × $22 per dlh = $154,000
c. Overallocated: Allocated $154,000 which is $9,000 more than actual of $145,000

Diff: 2

Terms: manufacturing overhead allocated

Objective: 7, 8

AACSB: Analytical skills

13) A local engineering firm is bidding on a design project for a new client. The total budgeted direct-labor costs for the firm are $400,000. The total budgeted indirect costs are $600,000. It is estimated that there are 8,000 billable hours in total.

**Required:**

a. What is the budgeted direct-labor cost rate?

b. What is the budgeted indirect-cost rate assuming direct-labor cost is the allocation base?

c. What should be the engineering firm bid on the project if the direct labor hours are estimated at 300 hours?

Answer:

a. $400,000/8,000 = $50/hour

b. $600,000/$400,000 = 150% of direct labor cost

c. (300 × 50) + (15,000 × 1.5) = $37,500

Diff: 3

Terms: normal costing

Objective: 8

AACSB: Analytical skills
14) A local CPA employs ten full-time professionals. The budgeted compensation per employee is $50,000. The maximum billable hours for each client are 400. Clients always receive their full amount of time. All professional labor costs are included in a single direct-cost category and are traced to jobs on a per-hour basis. Any other costs are included in a single indirect-cost pool, allocated according to professional labor-hours. Budgeted indirect costs for the year are $200,000 and the firm had 20 clients.

Required:

a. What is the direct-labor-cost rate per hour?
b. What is the indirect-cost rate per hour?

Answer:

a. Total direct cost = $50,000 \times 10 = $500,000
   Total hours = 400 \times 20 = 8,000
   Direct-cost rate per unit = \frac{$500,000}{8,000} = $62.50 per hour

b. Indirect-cost rate per unit = \frac{$200,000}{8,000} = $25.00 per hour

Diff: 2
Terms: indirect-cost rate
Objective: 8
AACSB: Analytical skills
Objective 5.1

1) If products are different, then for costing purposes:
A) an ABC costing system will yield more accurate cost numbers
B) a simple costing system should be used
C) a single indirect-cost rate should be used
D) none of the above
Answer: A
Diff: 1
Terms: activity-based costing (ABC)
Objective: 1
AACSB: Reflective thinking

2) Overcosting a particular product may result in:
A) loss of market share
B) pricing the product too low
C) operating efficiencies
D) understating total product costs
Answer: A
Diff: 2
Terms: product undercosting
Objective: 1
AACSB: Analytical skills

3) Undercosting of a product is most likely to result from:
A) misallocating direct labor costs
B) underpricing the product
C) overcosting another product
D) overstating total product costs
Answer: C
Diff: 2
Terms: product overcosting
Objective: 1
AACSB: Reflective thinking

4) A company produces three products; if one product is overcosted then:
A) one product is undercosted
B) one or two products are undercosted
C) two products are undercosted
D) no products are undercosted
Answer: B
Diff: 1
Terms: product-cost cross-subsidization
Objective: 1
AACSB: Ethical reasoning
5) Misleading cost numbers are most likely the result of misallocating:
A) direct material costs
B) direct manufacturing labor costs
C) indirect costs
D) All of these answers are correct.
Answer: C
Diff: 2
Terms: activity-based costing (ABC)
Objective: 1
AACSB: Reflective thinking

6) An accelerated need for refined cost systems is due to:
A) global monopolies
B) rising prices
C) intense competition
D) a shift toward increased direct costs
Answer: C
Diff: 2
Terms: activity-based costing (ABC)
Objective: 1
AACSB: Ethical reasoning

7) The use of a single indirect-cost rate is more likely to:
A) undercost high-volume simple products
B) undercost low-volume complex products
C) undercost lower-priced products
D) Both B and C are correct.
Answer: B
Diff: 2
Terms: product undercosting
Objective: 1
AACSB: Reflective thinking

8) Uniformly assigning the costs of resources to cost objects when those resources are actually used in a nonuniform way is called:
A) overcosting
B) undercosting
C) peanut-butter costing
D) department costing
Answer: C
Diff: 1
Terms: product-cost cross-subsidization
Objective: 1
AACSB: Reflective thinking
9) A top-selling product might actually result in losses for the company.  
Answer: TRUE  
Diff: 2  
Terms: product undercosting  
Objective: 1  
AACSB: Analytical skills

10) Companies that overcost products will most likely lose market share.  
Answer: TRUE  
Diff: 2  
Terms: product overcosting  
Objective: 1  
AACSB: Ethical reasoning

11) If companies increase market share in a given product line because their reported costs are less than their actual costs, they will become more profitable in the long run.  
Answer: FALSE  
Explanation: The actual costs will increase because of the additional sales and the other product lines (which are subsidizing the undercosting of the growing product line) will suffer. The net result will be the company having a lower operating income than it could have had.  
Diff: 2  
Terms: product undercosting  
Objective: 1  
AACSB: Reflective thinking

12) As product diversity and indirect costs increase, it is usually best to switch away from an activity based cost system to a broad averaging system.  
Answer: FALSE  
Explanation: The potential significant differences in costs relating to the products as well as the magnitude of indirect costs make a more refined costing system more appropriate.  
Diff: 2  
Terms: activity-based costing (ABC)  
Objective: 1  
AACSB: Reflective thinking

13) If a company overcosts one of its products, then it will undercost at least one of its other products.  
Answer: TRUE  
Diff: 2  
Terms: product-cost cross-subsidization  
Objective: 1  
AACSB: Ethical reasoning

14) Explain how a top-selling product may actually result in losses for the company.  
Answer: If indirect costs are not properly allocated to the products, a product may appear to cost less than it actually does cost to produce. If the selling price is based on these lower costs, the selling price may actually be lower than the costs needed to produce the product resulting in losses for the company.  
Diff: 1  
Terms: product-cost cross-subsidization  
Objective: 1  
AACSB: Reflective thinking
Objective 5.2

1) Refining a cost system includes:
   A) classifying as many costs as indirect costs as is feasible
   B) creating as many cost pools as possible
   C) identifying the activities involved in a process
   D) seeking a lesser level of detail
   Answer: C
   Diff: 2
   Terms: activity
   Objective: 2
   AACSB: Reflective thinking

2) Greater indirect costs are associated with:
   A) specialized engineering drawings
   B) quality specifications and testing
   C) inventoried materials and material control systems
   D) All of these answers are correct.
   Answer: D
   Diff: 1
   Terms: product-cost cross-subsidization
   Objective: 2
   AACSB: Reflective thinking

3) Design of an ABC system requires:
   A) that the job bid process be redesigned
   B) that a cause-and-effect relationship exists between resource costs and individual activities
   C) an adjustment to product mix
   D) Both B and C are correct.
   Answer: B
   Diff: 1
   Terms: activity-based costing (ABC)
   Objective: 2
   AACSB: Reflective thinking

4) Direct costs plus indirect costs equal total costs.
   Answer: TRUE
   Diff: 1
   Terms: activity-based costing (ABC)
   Objective: 2
   AACSB: Reflective thinking

5) When refining a costing system, a company should classify as many costs as possible as direct costs.
   Answer: TRUE
   Diff: 1
   Terms: refined costing system
   Objective: 2
   AACSB: Ethical reasoning
6) In a homogeneous cost pool, all costs have a similar cause-and-effect relationship with the cost-allocation base.
Answer: TRUE
Diff: 1
Terms: activity-based costing (ABC)
Objective: 2
AACSB: Reflective thinking

7) Indirect labor and distribution costs would most likely be in the same activity-cost pool.
Answer: FALSE
Explanation: Indirect labor and distribution costs would not be in the same activity-cost pool because their cost drivers are very dissimilar. A cost driver of indirect labor would include direct labor hours, while a cost driver of distribution costs would include, for example, cubic feet of cargo moved.
Diff: 2
Terms: activity-based costing (ABC)
Objective: 2
AACSB: Reflective thinking

8) Direct tracing of costs improves cost accuracy.
Answer: TRUE
Diff: 1
Terms: activity-based costing (ABC)
Objective: 2
AACSB: Reflective thinking

9) A cost-allocation base is a necessary element when using a strategy that will refine a costing system.
Answer: TRUE
Diff: 1
Terms: activity-based costing (ABC)
Objective: 2
AACSB: Reflective thinking

10) What are the factors that are causing many companies to refine their costing systems to obtain more accurate measures of the costs of their products?
Answer: The first cause is increasing product diversity. Companies are producing many more products than they used to, placing strains on more simple, older cost systems. A second cause is the overall increased in indirect costs and the relative decline of direct costs. The indirect nature of these costs requires allocation, and any inaccuracies in allocation of these costs become magnified as these indirect costs increase. A third cause would be advances in information technology that makes complex allocation of indirect costs less burdensome. Finally, increased competition from both national and international competitors has resulted in more pressure to reduce costs, as well as increasing the need for and value of information to support responses to these new threats.
Diff: 2
Terms: activity-based costing (ABC)
Objective: 2
AACSB: Reflective thinking
Objective 5.3

1) ABC systems create:
A) one large cost pool
B) homogenous activity-related cost pools
C) activity-cost pools with a broad focus
D) activity-cost pools containing many direct costs
Answer: B
Diff: 1
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Reflective thinking

2) Logical cost allocation bases include:
A) cubic feet of packages moved to measure distribution activity
B) number of setups used to measure setup activity
C) number of design hours to measure designing activity
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Reflective thinking

3) ABC systems:
A) highlight the different levels of activities
B) limit cost drivers to units of output
C) allocate costs based on the overall level of activity
D) generally undercost complex products
Answer: A
Diff: 2
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Reflective thinking

4) A single indirect-cost rate may distort product costs because:
A) there is an assumption that all support activities affect all products
B) it recognizes specific activities that are required to produce a product
C) costs are not consistently recorded
D) it fails to measure the correct amount of total costs
Answer: A
Diff: 2
Terms: product-cost cross-subsidization
Objective: 3
AACSB: Communication
5) Traditional cost systems distort product costs because:
A) they do not know how to identify the appropriate units
B) competitive pricing is ignored
C) they emphasize financial accounting requirements
D) they apply average support costs to each unit of product
Answer: D
Diff: 2
Terms: product-cost cross-subsidization
Objective: 3
AACSB: Reflective thinking

6) Which of the following statements about activity-based costing is NOT true?
A) Activity-based costing is useful for allocating marketing and distribution costs.
B) Activity-based costing is more likely to result in major differences from traditional costing systems if the firm manufactures only one product rather than multiple products.
C) Activity-based costing seeks to distinguish batch-level, product-sustaining, and facility-sustaining costs, especially when they are not proportionate to one another.
D) Activity-based costing differs from traditional costing systems in that products are not cross-subsidized.
Answer: B
Diff: 2
Terms: product-cost cross-subsidization
Objective: 3
AACSB: Reflective thinking

7) Activity-based costing (ABC) can eliminate cost distortions because ABC:
A) develops cost drivers that have a cause-and-effect relationship with the activities performed
B) establishes multiple cost pools
C) eliminates product variations
D) recognizes interactions between different departments in assigning support costs
Answer: A
Diff: 1
Terms: product-cost cross-subsidization
Objective: 3
AACSB: Reflective thinking

8) Product lines that produce different variations (models, styles, or colors) often require specialized manufacturing activities that translate into:
A) fewer indirect costs for each product line
B) decisions to drop product variations
C) a greater number of direct manufacturing labor cost allocation rates
D) greater overhead costs for each product line
Answer: D
Diff: 2
Terms: product-cost cross-subsidization
Objective: 3
AACSB: Reflective thinking
Answer the following questions using the information below:

Mertens Company provides the following ABC costing information:

<table>
<thead>
<tr>
<th>Activities</th>
<th>Total Costs</th>
<th>Activity-cost drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Account inquiry hours</td>
<td>$200,000</td>
<td>10,000 hours</td>
</tr>
<tr>
<td>Account billing lines</td>
<td>$140,000</td>
<td>4,000,000 lines</td>
</tr>
<tr>
<td>Account verification accounts</td>
<td>$75,000</td>
<td>40,000 accounts</td>
</tr>
<tr>
<td>Correspondence letters</td>
<td>$ 25,000</td>
<td>4,000 letters</td>
</tr>
<tr>
<td>Total costs</td>
<td>$440,000</td>
<td></td>
</tr>
</tbody>
</table>

The above activities are used by Departments A and B as follows:

<table>
<thead>
<tr>
<th></th>
<th>Department A</th>
<th>Department B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Account inquiry hours</td>
<td>2,000 hours</td>
<td>4,000 hours</td>
</tr>
<tr>
<td>Account billing lines</td>
<td>400,000 lines</td>
<td>200,000 lines</td>
</tr>
<tr>
<td>Account verification accounts</td>
<td>10,000 accounts</td>
<td>8,000 accounts</td>
</tr>
<tr>
<td>Correspondence letters</td>
<td>1,000 letters</td>
<td>1,600 letters</td>
</tr>
</tbody>
</table>

9) How much of the account inquiry cost will be assigned to Department A?
   A) $40,000
   B) $200,000
   C) $80,000
   D) None of these answers are correct.

   Answer: A
   Explanation: A) ($200,000 / 10,000) × 2,000 = $40,000
   Diff: 2
   Terms: activity-based costing (ABC)
   Objective: 3
   AACSB: Analytical skills

10) How much of the account billing cost will be assigned to Department B?
    A) $14,000
    B) $140,000
    C) $7,000
    D) None of these answers are correct.

    Answer: C
    Explanation: C) ($140,000 / 4,000,000) × 200,000 = $7,000
    Diff: 2
    Terms: activity-based costing (ABC)
    Objective: 3
    AACSB: Analytical skills
11) How much of account verification costs will be assigned to Department A?
   A) $15,000
   B) $18,750
   C) $75,000
   D) $5,000
   Answer: B
   Explanation: B) \( \frac{75,000}{40,000} \times 10,000 = 18,750 \)
   Diff: 2
   Terms: activity-based costing (ABC)
   Objective: 3
   AACSB: Analytical skills

12) How much of correspondence costs will be assigned to Department B?
   A) $800
   B) $6,250
   C) $25,000
   D) $10,000
   Answer: D
   Explanation: D) \( \frac{25,000}{4,000} \times 1,600 = 10,000 \)
   Diff: 2
   Terms: activity-based costing (ABC)
   Objective: 3
   AACSB: Analytical skills

13) How much of the total costs will be assigned to Department A?
   A) $79,000
   B) $40,000
   C) $112,000
   D) $440,000
   Answer: A
   Explanation:
   A) \( \frac{200,000}{10,000} \times 2,000 = 40,000 \)
   B) \( \frac{140,000}{4,000,000} \times 400,000 = 14,000 \)
   C) \( \frac{75,000}{40,000} \times 10,000 = 18,750 \)
   D) \( \frac{25,000}{4,000} \times 1,000 = 6,250 \)
   \( \text{Total} = 79,000 \)
   Diff: 2
   Terms: activity-based costing (ABC)
   Objective: 3
   AACSB: Analytical skills
14) How much of the total costs will be assigned to Department B?
A) $79,000
B) $40,000
C) $112,000
D) $440,000
Answer: C
Explanation:
C) ($200,000 / 10,000)  x 4,000  = $ 80,000
($140,000 / 4,000,000)  x 200,000  = $ 7,000
($75,000 / 40,000)  x 8,000  = $ 15,000
($25,000 / 4,000)  x 1,600  = $ 10,000
$112,000

Diff: 3
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Analytical skills

15) Dalrymple Company produces a special spray nozzle. The budgeted indirect total cost of inserting the spray nozzle is $80,000. The budgeted number of nozzles to be inserted is 40,000. What is the budgeted indirect cost allocation rate for this activity?
A) $0.50
B) $1.00
C) $1.50
D) $2.00
Answer: D
Explanation: D) $80,000 / 40,000 = $2.00
Diff: 1
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Analytical skills

16) Activity-based costing is most likely to yield benefits for companies with all of the following characteristics EXCEPT:
A) numerous products that consume different amounts of resources
B) operations that remain fairly consistent
C) a highly competitive environment, where cost control is critical
D) accessible accounting and information systems expertise to maintain the system
Answer: B
Diff: 2
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Reflective thinking
17) Each of the following statements is true EXCEPT:
A) traditional product costing systems seek to assign all manufacturing costs to products
B) ABC product costing systems seek to assign all manufacturing costs to products
C) traditional product costing systems are more refined than an ABC system
D) cost distortions occur when a mismatch (incorrect association) occurs between the way indirect costs are incurred and the basis for their assignment to individual products
Answer: C
Diff: 1
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Reflective thinking

Answer the following questions using the information below:

Happy Valley Land and Snow Company provides the following ABC costing information:

<table>
<thead>
<tr>
<th>Activities</th>
<th>Total Costs</th>
<th>Activity-cost drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor hours</td>
<td>$320,000</td>
<td>8,000 hours</td>
</tr>
<tr>
<td>Gas</td>
<td>$36,000</td>
<td>6,000 gallons</td>
</tr>
<tr>
<td>Invoices</td>
<td>$40,000</td>
<td>2,500 invoices</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td><strong>$396,000</strong></td>
<td></td>
</tr>
</tbody>
</table>

The above activities used by their three departments are:

<table>
<thead>
<tr>
<th>Activities</th>
<th>Lawn Department</th>
<th>Bush Department</th>
<th>Plowing Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor hours</td>
<td>2,500 hours</td>
<td>1,200 hours</td>
<td>4,300 hours</td>
</tr>
<tr>
<td>Gas</td>
<td>1,500 gallons</td>
<td>800 gallons</td>
<td>3,700 gallons</td>
</tr>
<tr>
<td>Invoices</td>
<td>1,600 invoices</td>
<td>400 invoices</td>
<td>500 invoices</td>
</tr>
</tbody>
</table>

18) How much of the labor cost will be assigned to the Lawn Department?
A) $100,000
B) $25,600
C) $40,000
D) None of these answers are correct.
Answer: A
Explanation: A) ($32,000 / 8,000) × 2,500 = $100,000
Diff: 2
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Analytical skills
19) How much of the gas cost will be assigned to the Plowing Department?
A) $50,000
B) $22,200
C) $30,000
D) None of these answers are correct.
Answer: B
Explanation: B) ($36,000 / 6,000) × 3,700 = $22,200
Diff: 2
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Analytical skills

20) How much of invoice cost will be assigned to the Bush Department?
A) $6,400
B) $8,000
C) $25,600
D) $40,000
Answer: A
Explanation: A) ($40,000 / 2,500) × 400 = $6,400
Diff: 2
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Analytical skills

21) How much of the gas cost will be assigned to the Lawn Department?
A) $4,800
B) $20,000
C) $9,000
D) $22,200
Answer: C
Explanation: C) ($36,000 / 6,000) × 1,500 = $9,000
Diff: 2
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Analytical skills
22) How much of the total cost will be assigned to the Plowing Department?
A) $396,000  
B) $202,200  
C) $134,600  
D) $172,000  
Answer: B  
Explanation: 
B) ($320,000 / 8,000)  x 4,300 = $172,000 
($36,000 / 6,000)  x 3,700 = $22,200  
($40,000 / 2,500) x 500 = $8,000  
$202,200

Diff: 2  
Terms: activity-based costing (ABC)  
Objective: 3  
AACSB: Analytical skills

23) How much of the total costs will be assigned to the Lawn Department?
A) $100,000  
B) $49,200  
C) $200,000  
D) $134,600  
Answer: D  
Explanation: 
D) ($320,000 / 8,000)  x 2,500 = $100,000  
($36,000 / 6,000)  x 1,500 = $9,000  
($20,000 / 2,500) x 1,600 = $25,600  
$134,600

Diff: 3  
Terms: activity-based costing (ABC)  
Objective: 3  
AACSB: Analytical skills
Answer the following questions using the information below:

Gregory Enterprises has identified three cost pools to allocate overhead costs. The following estimates are provided for the coming year:

<table>
<thead>
<tr>
<th>Cost Pool</th>
<th>Overhead Costs</th>
<th>Cost driver</th>
<th>Activity level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervision of direct labor</td>
<td>$320,000</td>
<td>Direct labor-hours</td>
<td>800,000</td>
</tr>
<tr>
<td>Machine maintenance</td>
<td>$120,000</td>
<td>Machine-hours</td>
<td>960,000</td>
</tr>
<tr>
<td>Facility rent</td>
<td>$200,000</td>
<td>Square feet of area</td>
<td>100,000</td>
</tr>
<tr>
<td>Total overhead costs</td>
<td>$640,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The accounting records show the Mossman Job consumed the following resources:

<table>
<thead>
<tr>
<th>Cost driver</th>
<th>Actual level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor-hours</td>
<td>200</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>1,600</td>
</tr>
<tr>
<td>Square feet of area</td>
<td>50</td>
</tr>
</tbody>
</table>

24) If direct labor-hours are considered the only overhead cost driver, what is the single cost driver rate for Gregory Enterprises?
A) $0.50 per direct labor-hour  
B) $0.80 per direct labor-hour 
C) $0.40 per direct labor-hour 
D) $1.20 per direct labor-hour 
Answer:  B
Explanation:  B) $640,000 / 800,000 = $0.80 per dlh 
Diff: 2
Terms: activity-based costing (ABC) 
Objective:  3
AACSB: Analytical skills

25) Using direct labor-hours as the only overhead cost driver, what is the amount of overhead costs allocated to the Mossman Job?
A) $160 
B) $120 
C) $240 
D) $125 
Answer:  A
Explanation:  A) 200 dlh × (640,000 / 800,000) = $160 
Diff: 2
Terms: activity-based costing (ABC) 
Objective:  3
AACSB: Analytical skills
Answer the following questions using the information below:

Velshi Printers has contracts to complete weekly supplements required by forty-six customers. For the year 2010, manufacturing overhead cost estimates total $840,000 for an annual production capacity of 12 million pages.

For 2010 Velshi Printers has decided to evaluate the use of additional cost pools. After analyzing manufacturing overhead costs, it was determined that number of design changes, setups, and inspections are the primary manufacturing overhead cost drivers. The following information was gathered during the analysis:

<table>
<thead>
<tr>
<th>Cost pool</th>
<th>Manufacturing overhead costs</th>
<th>Activity level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design changes</td>
<td>$ 120,000</td>
<td>300 design changes</td>
</tr>
<tr>
<td>Setups</td>
<td>640,000</td>
<td>5,000 setups</td>
</tr>
<tr>
<td>Inspections</td>
<td>80,000</td>
<td>8,000 inspections</td>
</tr>
<tr>
<td>Total</td>
<td>$840,000</td>
<td></td>
</tr>
</tbody>
</table>

During 2010, two customers, Money Managers and Hospital Systems, are expected to use the following printing services:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Money Managers</th>
<th>Hospital Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pages</td>
<td>60,000</td>
<td>76,000</td>
</tr>
<tr>
<td>Design changes</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Setups</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Inspections</td>
<td>30</td>
<td>38</td>
</tr>
</tbody>
</table>

26) What is the cost driver rate if manufacturing overhead costs are considered one large cost pool and are assigned based on 12 million pages of production capacity?
A) $0.10 per page  
B) $0.07 per page  
C) $0.70 per page  
D) $0.05 per page
Answer:  B  
Explanation:  B) $0.07 per page = ($840,000 / 12,000,000 pages)

Diff: 2  
Terms: activity-based costing (ABC)  
Objective: 3  
AACSB: Analytical skills
27) Using pages printed as the only overhead cost driver, what is the manufacturing overhead cost estimate for Money Managers during 2010?
A) $5,000
B) $3,500
C) $4,200
D) $6,000
Answer: C
Explanation: C) $4,200 = [60,000 pages × ($840,000 / 12,000,000)]
Diff: 2
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

Whitman Printing has contracts to complete weekly supplements required by forty-six customers. For the year 20X5, manufacturing overhead cost estimates total $840,000 for an annual production capacity of 12 million pages.

For 2010 Whitman Printing decided to evaluate the use of additional cost pools. After analyzing manufacturing overhead costs, it was determined that number of design changes, setups, and inspections are the primary manufacturing overhead cost drivers. The following information was gathered during the analysis:

<table>
<thead>
<tr>
<th>Cost pool</th>
<th>Manufacturing overhead costs</th>
<th>Activity level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design changes</td>
<td>$120,000</td>
<td>200 design changes</td>
</tr>
<tr>
<td>Setups</td>
<td>640,000</td>
<td>4,000 setups</td>
</tr>
<tr>
<td>Inspections</td>
<td>80,000</td>
<td>16,000 inspections</td>
</tr>
<tr>
<td>Total manufacturing overhead costs</td>
<td>$840,000</td>
<td></td>
</tr>
</tbody>
</table>

During 2010, two customers, Money Managers and Hospital Systems, are expected to use the following printing services:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Money Managers</th>
<th>Hospital Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pages</td>
<td>60,000</td>
<td>76,000</td>
</tr>
<tr>
<td>Design changes</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Setups</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Inspections</td>
<td>30</td>
<td>38</td>
</tr>
</tbody>
</table>

28) If manufacturing overhead costs are considered one large cost pool and are assigned based on 12 million pages of production capacity, what is the cost driver rate?

A) $0.50 per page  
B) $0.10 per page  
C) $0.05 per page  
D) $0.07 per page  

Answer: D

Explanation: D) $0.07 per page = ($840,000 / 12,000,000 pages)

Diff: 2  
Terms: activity-based costing (ABC)  
Objective: 3  
AACSBI: Analytical skills
29) Using the cost driver rate determined in the previous question, what is the manufacturing overhead cost estimate for Hospital Systems during 2010?
A) Manufacturing overhead costs applied to Hospital Systems total $4,200.
B) Manufacturing overhead costs applied to Hospital Systems total $3,800.
C) Manufacturing overhead costs applied to Hospital Systems total $5,320.
D) Manufacturing overhead costs applied to Hospital Systems total $7,200.
Answer: C
Explanation: C) $5,320 = 76,000 pages × ($840,000 / 12,000,000 pages)
Diff: 2
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Analytical skills

30) Activity-based costing helps identify various activities that explain why costs are incurred.
Answer: TRUE
Diff: 1
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Communication

31) An activity-based costing system is necessary for costing services that are similar.
Answer: FALSE
Explanation: An activity-based costing system is only necessary when services are dissimilar and different amounts of resources are used by each service.
Diff: 1
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Reflective thinking

32) Traditional systems are likely to overcost complex products with lower production volume.
Answer: FALSE
Explanation: Traditional systems are likely to undercost complex products with lower production volume.
Diff: 2
Terms: product undercosting
Objective: 3
AACSB: Reflective thinking

33) For activity-based cost systems, activity costs are assigned to products in the proportion of the demand they place on activity resources.
Answer: TRUE
Diff: 2
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Reflective thinking
34) Explain how activity-based costing systems can provide more accurate product costs than traditional cost systems.
Answer: A key reason for assigning indirect costs using an ABC system rather than a traditional system is that ABC cost systems reflect differences required by different processes. Activity-based costing systems provide better product costs when they identify and cost more indirect cost differences among products. Activity-based costing seeks to distinguish batch-level, product-sustaining, and facility-sustaining costs especially when they are not proportionate to one another.

Unit-level drivers in traditional cost systems distort product costs because, effectively, these systems assume that all indirect activities affect all products. Thus, these systems assign each unit of product an average cost that fails to recognize the specific activities that are required to produce that product.

Activity-based costing differs from traditional costing systems in that products are not cross-subsidized by support costs being shared by everyone. Activity-based costing is more likely to result in major differences from traditional costing systems if the firm manufactures multiple products rather than only one product.

Diff: 2
Terms: activity-based costing (ABC)
Objective: 3
AACSB: Reflective thinking

1) The most likely example of an output unit-level cost is:
A) general administrative costs
B) paying suppliers for orders received
C) engineering costs
D) machine depreciation
Answer: D
Diff: 1
Terms: output unit-level costs
Objective: 4
AACSB: Analytical skills

2) The most likely example of a batch-level cost is:
A) utility costs
B) machine repairs
C) product-designing costs
D) setup costs
Answer: D
Diff: 1
Terms: batch-level costs
Objective: 4
AACSB: Analytical skills
3) Design costs are an example of:
A) unit-level costs
B) batch-level costs
C) product-sustaining costs
D) facility-sustaining costs
Answer: C
Diff: 1
Terms: product-sustaining costs
Objective: 4
AACSB: Reflective thinking

4) ________ costs support the organization as a whole.
A) Unit-level
B) Batch-level
C) Product-sustaining
D) Facility-sustaining
Answer: D
Diff: 1
Terms: facility-sustaining costs
Objective: 4
AACSB: Reflective thinking

5) It is usually difficult to find good cause-and-effect relationships between ________ and a cost allocation base.
A) unit-level costs
B) batch-level costs
C) product-sustaining costs
D) facility-sustaining costs
Answer: D
Diff: 1
Terms: facility-sustaining costs
Objective: 4
AACSB: Reflective thinking

6) To set realistic selling prices:
A) all costs should be allocated to products
B) costs should only be allocated when there is a strong cause-and-effect relationship
C) only unit-level costs and batch-level costs should be allocated
D) only unit-level costs should be allocated
Answer: A
Diff: 2
Terms: facility-sustaining costs
Objective: 4
AACSB: Reflective thinking
7) Different products consume different proportions of manufacturing overhead costs because of differences in all of the following EXCEPT:
   A) selling prices
   B) customers' customization specifications
   C) setup times
   D) product design
   Answer: A
   Diff: 1
   Terms: product-cost cross-subsidization
   Objective: 4
   AACSB: Reflective thinking

8) Unit-level cost drivers are most appropriate as an overhead assignment base when:
   A) several complex products are manufactured
   B) only one product is manufactured
   C) direct labor costs are low
   D) factories produce a varied mix of products
   Answer: B
   Diff: 2
   Terms: output unit-level costs
   Objective: 4
   AACSB: Reflective thinking

9) With traditional costing systems, products manufactured in small batches and in small annual volumes may be ________ because batch-related and product-sustaining costs are assigned using unit-related drivers.
   A) overcosted
   B) fairly costed
   C) undercosted
   D) ignored
   Answer: C
   Diff: 2
   Terms: output unit-level costs, batch-level costs
   Objective: 4
   AACSB: Ethical reasoning
Answer the following questions using the information below:

Products S5 and CP8 each are assigned $100.00 in indirect costs by a traditional costing system. An activity analysis revealed that although production requirements are identical, S5 requires 45 minutes less setup time than CP8.

10) According to an ABC system, CP8 is ________ under the traditional system.
   A) undercosted
   B) overcosted
   C) fairly costed
   D) accurately costed
   Answer: A
   Diff: 2
   Terms: product undercosting
   Objective: 4
   AACSB: Reflective thinking

11) According to an ABC system, S5 uses a disproportionately:
   A) smaller amount of unit-level costs
   B) larger amount of unit-level costs
   C) smaller amount of batch-level costs
   D) larger amount of batch-level costs
   Answer: C
   Diff: 2
   Terms: product overcosting
   Objective: 4
   AACSB: Reflective thinking

12) Unit-level measures can distort product costing because the demand for overhead resources may be driven by batch-level or product-sustaining activities.
   Answer: TRUE
   Diff: 2
   Terms: output unit-level costs, batch-level costs, product-sustaining costs
   Objective: 4
   AACSB: Reflective thinking

13) Output unit-level costs CANNOT be determined unless you know how many units are in a given batch.
   Answer: FALSE
   Explanation: Output unit-level costs are the costs of the activities performed on each individual unit whereas batch-level costs are the costs of activities related to a group of units.
   Diff: 2
   Terms: output unit-level costs, batch-level costs, product-sustaining costs
   Objective: 4
   AACSB: Reflective thinking
14) Using multiple unit-level cost drivers generally constitutes an effective activity-based cost system.  
Answer: FALSE  
Explanation: In addition to unit-level cost drivers, an effective activity-based cost system usually uses batch-level, product-sustaining, and facility-sustaining cost drivers.  
Diff: 2  
Terms: output unit-level costs  
Objective: 4  
AACSB: Reflective thinking

15) Misleading cost numbers are larger when unit-level assignments and the alternative activity-cost-driver assignments are proportionately dissimilar to each other.  
Answer: TRUE  
Diff: 2  
Terms: output unit-level costs  
Objective: 4  
AACSB: Communication

16) Explain how traditional cost systems, using a single unit-level cost rate, may distort product costs.  
Answer: Unit-level measures can distort product costing because the demand for indirect activities may be driven by batch-level, product-sustaining, customer-sustaining, or facility-sustaining activities. Cost distortions are larger when the traditional systems' unit-level cost drivers and the alternative activity-cost drivers differ proportionately more from each other. Traditional systems are likely to undercost products with lower production volumes (relatively fewer units of production) and overcost products with higher production volumes (relatively greater units of production).  
Diff: 2  
Terms: output unit-level costs, product overcosting, product undercosting  
Objective: 4  
AACSB: Reflective thinking

17) What are the four parts of the cost hierarchy. Briefly explain each part, and contrast this cost hierarchy to the fixed-variable dichotomy?  
Answer: The four parts of the cost hierarchy are output unit-level costs, batch-level costs, product (or service) sustaining costs, and facility sustaining costs. Output unit-level costs are costs of activities performed on each individual unit of a product or service. Batch-level costs are the costs of activities related to a group of units of products or services rather than to each individual unit of product or service. Product (or service) sustaining costs are the costs of activities undertaken to support individual products or services regardless of the number of units or batches in which the products are produced. Facility-sustaining costs are the costs of activities that cannot be traced to individual products or services but support the organization as a whole. When compared to the fixed-variable dichotomy, which considers only units of output as a cost driver, the four part cost hierarchy provides opportunity to model many different cost drivers. For example, batch-level costs and product (or service) sustaining costs are driven by the number of batches of a product and the number of different products. Neither of these class of cost drivers are able to be considered in a simple fixed-variable dichotomy.  
Diff: 2  
Terms: cost hierarchy  
Objective: 4  
AACSB: Reflective thinking
Objective 5.5

1) Put the following ABC implementation steps in order:
   A) Compute the allocation rates.
   B) Compute the total cost of the products.
   C) Identify the products that are the cost objects.
   D) Select the cost allocation bases.
A) DACB  
B) DBCA  
C) BADC  
D) CDAB  
Answer: D  
Diff: 1  
Terms: activity-based costing (ABC)  
Objective: 5  
AACSB: Analytical skills

2) ABC systems identify ______ costs used by products.
   A) all  
   B) short-term fixed  
   C) short-term variable  
   D) long-term fixed  
   Answer: A  
   Diff: 1  
   Terms: activity-based costing (ABC)  
   Objective: 5  
   AACSB: Reflective thinking

3) The focus of ABC systems is on:
   A) long-term decisions  
   B) short-term decisions  
   C) make-or-buy decisions  
   D) special-pricing decisions  
   Answer: A  
   Diff: 2  
   Terms: activity-based costing (ABC)  
   Objective: 5  
   AACSB: Reflective thinking

4) When designing a costing system, it is easiest to:
   A) calculate total costs first and then per-unit cost  
   B) calculate per-unit costs first and then total costs  
   C) calculate long-term costs first and then short-term costs  
   D) calculate short-term costs first and then long-term costs  
   Answer: A  
   Diff: 1  
   Terms: activity-based costing (ABC)  
   Objective: 5  
   AACSB: Reflective thinking
5) ABC assumes all costs are _______ because over the long run management can adjust the amount of resources employed.
A) fixed
B) variable
C) committed
D) nondiscretionary
Answer: B
Diff: 2
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Reflective thinking

6) A manufacturing firm produces multiple families of products requiring various combinations of different types of parts. Of the following, the most appropriate cost driver for assigning materials handling costs to the various products is:
A) direct labor hours
B) number of units produced
C) number of parts used
D) number of suppliers involved
Answer: C
Diff: 1
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Reflective thinking

Answer the following questions using the information below:

Fey Corporation manufactures two models of office chairs, a standard and a deluxe model. The following activity and cost information has been compiled:

<table>
<thead>
<tr>
<th>Product</th>
<th>Number of Setups</th>
<th>Number of Components</th>
<th>Number of Direct Labor Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>22</td>
<td>8</td>
<td>375</td>
</tr>
<tr>
<td>Deluxe</td>
<td>28</td>
<td>12</td>
<td>225</td>
</tr>
</tbody>
</table>

Overhead costs $40,000 $80,000

7) Assume a traditional costing system applies the $120,000 of overhead costs based on direct labor hours. What is the total amount of overhead costs assigned to the standard model?
A) $49,600
B) $70,400
C) $75,000
D) $45,000
Answer: C
Explanation: C) \($120,000 / (375 + 225)\) \times 375 = $75,000
Diff: 2
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Analytical skills
8) Assume a traditional costing system applies the $120,000 of overhead costs based on direct labor hours. What is the total amount of overhead costs assigned to the deluxe model?
A) $49,600
B) $70,400
C) $75,000
D) $45,000
Answer: D
Explanation: D) \( \frac{$120,000}{(375 + 225)} \times 225 = $45,000 \)
Diff: 2
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Analytical skills

9) Number of setups and number of components are identified as activity-cost drivers for overhead. Assuming an activity-based costing system is used, what is the total amount of overhead costs assigned to the standard model?
A) $49,600
B) $70,400
C) $75,000
D) $45,000
Answer: A
Explanation: A) Setups: \( \frac{$40,000}{(22 + 28)} = $800 \)
Components: \( \frac{$80,000}{(8 + 12)} = $4,000 \)
\(($800 \times 22) + ($4,000 \times 8) = $49,600 \)
Diff: 2
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Analytical skills

10) Number of setups and number of components are identified as activity-cost drivers for overhead. Assuming an activity-based costing system is used, what is the total amount of overhead costs assigned to the deluxe model?
A) $49,600
B) $70,400
C) $75,000
D) $45,000
Answer: B
Explanation: B) \( \frac{$40,000}{(22 + 28)} \times 28 \) + \( \frac{$80,000}{(8 + 12)} \times 12 \) = $70,400
Diff: 2
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Analytical skills
Answer the following questions using the information below:

Racer X Corporation manufactures two models of motorized go-carts, a standard and a deluxe model. The following activity and cost information has been compiled:

<table>
<thead>
<tr>
<th>Product</th>
<th>Number of Setups</th>
<th>Number of Components</th>
<th>Number of Direct Labor Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>15</td>
<td>10</td>
<td>750</td>
</tr>
<tr>
<td>Deluxe</td>
<td>35</td>
<td>15</td>
<td>500</td>
</tr>
</tbody>
</table>

Overhead costs $15,000 $25,000

11) Assume a traditional costing system applies the $40,000 of overhead costs based on direct labor hours. What is the total amount of overhead cost assigned to the standard model?
   A) $16,000
   B) $24,000
   C) $25,000
   D) $15,000
   Answer:  B
   Explanation:  B) [$40,000 / (750 + 500)] × 750 = $24,000
   Diff: 2
   Terms: activity-based costing (ABC)
   Objective:  5
   AACSB: Analytical skills

12) Assume a traditional costing system applies the $40,000 of overhead costs based on direct labor hours. What is the total amount of overhead cost assigned to the deluxe model?
   A) $16,000
   B) $24,000
   C) $25,000
   D) $15,000
   Answer:  A
   Explanation:  A) [$40,000 / (750 + 500)] × 500 = $16,000
   Diff: 2
   Terms: activity-based costing (ABC)
   Objective:  5
   AACSB: Analytical skills
13) Number of setups and number of components are identified as activity-cost drivers for overhead. Assuming an activity-based costing system is used, what is the total amount of overhead cost assigned to the standard model?
A) $25,500
B) $15,000
C) $14,500
D) $24,000
Answer: C
Explanation: C) Setups: 15,000 / (15 + 35) = $300
Components: $25,000 / (10 + 15) = $1,000
($300 \times 15) + ($1,000 \times 10) = $14,500
Diff: 2
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Analytical skills

14) Number of setups and number of components are identified as activity-cost drivers for overhead. Assuming an activity-based costing system is used, what is the total amount of overhead cost assigned to the deluxe model?
A) $25,500
B) $25,000
C) $24,000
D) $12,500
Answer: A
Explanation: A) Setups: $15,000 / (15 + 35) = $300
Components: $25,000 / (10 + 15) = $1,000
($300 \times 35) + ($1,000 \times 15) = $25,500
Diff: 2
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Analytical skills
Answer the following questions using the information below:

Tiger Pride produces two product lines: T-shirts and Sweatshirts. Product profitability is analyzed as follows:

<table>
<thead>
<tr>
<th></th>
<th>T-SHIRTS</th>
<th>SWEATSHIRTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production and sales</td>
<td>60,000 units</td>
<td>35,000 units</td>
</tr>
<tr>
<td>selling volume</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selling price</td>
<td>$16.00</td>
<td>$29.00</td>
</tr>
<tr>
<td>Direct material</td>
<td>$ 2.00</td>
<td>$ 5.00</td>
</tr>
<tr>
<td>Direct labor</td>
<td>$ 4.50</td>
<td>$ 7.20</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>$ 2.00</td>
<td>$ 3.00</td>
</tr>
<tr>
<td>Gross profit</td>
<td>$ 7.50</td>
<td>$13.80</td>
</tr>
<tr>
<td>Selling and</td>
<td></td>
<td></td>
</tr>
<tr>
<td>administrative</td>
<td>$ 4.00</td>
<td>$ 7.00</td>
</tr>
<tr>
<td>Operating profit</td>
<td>$ 3.50</td>
<td>$ 6.80</td>
</tr>
</tbody>
</table>

What is projected operating income if direct materials costs of T-Shirts increase to $4.00 per unit and direct labor costs of Sweatshirts increase to $8.20 per unit.

15) Under the revised ABC system, the activity-cost driver rate for the supervision activity is:

A) $2.58  
B) $2.40  
C) $2.24  
D) $1.16  

Answer: D  
Explanation: D) $100,920 / (45,000 dlh + 42,000 dlh) = $1.16 per dlh  
Diff: 1  
Terms: activity-based costing (ABC)  
Objective: 5  
AACSB: Analytical skills

16) Under the revised ABC system, supervision costs allocated to Sweatshirts will be:

A) $48,720  
B) $100,800  
C) $100,920  
D) None of these answers are correct.  

Answer: A  
Explanation: A) $100,920 / (45,000 dlh + 42,000 dlh) = $1.16 per dlh × 42,000 dlh = $48,720  
Diff: 1  
Terms: activity-based costing (ABC)  
Objective: 5  
AACSB: Analytical skills
17) Under the revised ABC system, total overhead costs allocated to Sweatshirts will be:
A) $48,720
B) $76,720
C) $224,920
D) None of these answers are correct.
Answer: B
Explanation: B) $124,000 / (60,000 inspections + 17,500 inspections) = $1.60 per inspection × 17,500 = $28,000 plus
$100,920 / (45,000 dlh + 42,000 dlh) = $1.16 per dlh × 42,000 dlh = $48,720;
$28,000 + $48,720 = $76,720
Diff: 2
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Analytical skills

18) Under the revised ABC system, overhead costs per unit for the Sweatshirts will be:
A) $1.39 per unit
B) $1.60 per unit
C) $2.19 per unit
D) $2.47 per unit
Answer: C
Explanation: C) $76,720 / 35,000 sweatshirts = $2.19
Diff: 2
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Analytical skills

19) Using an ABC system, next year's estimates show manufacturing overhead costs will total $228,300 for 52,000 T-shirts. If all other T-shirt costs and sales prices remain the same, the profitability that can be expected is:
A) $5.41 per t-shirt
B) $4.39 per t-shirt
C) $1.11 per t-shirt
D) ($0.81) per t-shirt
Answer: C
Explanation: C) [52,000 ($16 - $2.00 - $4.50 - $4.00)] - $228,300 = $57,700 / 52,000 = $1.11
Diff: 3
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Analytical skills
Answer the following questions using the information below:

Mayan Potters manufactures two sizes of ceramic paperweights, regular and jumbo. The following information applies to their expectations for the planning period:

<table>
<thead>
<tr>
<th>Cost Pool</th>
<th>Overhead Costs</th>
<th>Activity-cost driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials handling</td>
<td>$45,000</td>
<td>90,000 orders</td>
</tr>
<tr>
<td>Machine maintenance</td>
<td>$300,000</td>
<td>15,000 maintenance hours</td>
</tr>
<tr>
<td>Setups</td>
<td>$270,000</td>
<td>45,000 setups</td>
</tr>
<tr>
<td>Inspections</td>
<td>$105,000</td>
<td>21,000 inspections</td>
</tr>
<tr>
<td><strong>Total support costs</strong></td>
<td><strong>$720,000</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Production Estimates**

<table>
<thead>
<tr>
<th>Production units</th>
<th>=</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular</td>
<td>8,000,000 units</td>
</tr>
<tr>
<td>Jumbo</td>
<td>16,000,000 units</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>200,000 mh</td>
</tr>
<tr>
<td>Labor-hours</td>
<td>400,000 dlh</td>
</tr>
</tbody>
</table>

Mayan Potters uses an ABC system and assigns overhead costs based on the overhead activity information provided above.

20) The activity-cost driver for the materials handling activity is:
A) orders
B) maintenance hours
C) production units
D) setups
Answer: A
Diff: 1
Terms: activity
Objective: 5
AACSB: Reflective thinking

21) The materials handling activity-cost driver rate is:
A) $2.00
B) $20.00
C) $0.50
D) $5.00
Answer: C
Explanation: C) $45,000 / 90,000 orders = $0.50 per order
Diff: 1
Terms: activity
Objective: 5
AACSB: Analytical skills
22) The inspections activity-cost driver rate is:
A) $0.50
B) $2.00
C) $20.00
D) $5.00
Answer: D
Explanation: D) $105,000 / 21,000 inspections = $5.00 per inspection
Diff: 1
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Analytical skills

23) During October, Mayan produced 700,000 regular ceramic paperweights and Mayan's production manager counted 2,000 orders; 1,000 maintenance-hours; 2,000 setups; and 2,000 inspections for the regular product line. For October, Mayan's controller assigned ________ indirect costs to the regular product line.
A) $43,000
B) $25,000
C) $34,000
D) None of these answers are correct.
Answer: A
Explanation: A) \[
\frac{45,000}{90,000} \times 2,000 + \left(\frac{300,000}{15,000} \times 1,000\right) + \left(\frac{270,000}{45,000} \times 2,000\right) + \left(\frac{105,000}{21,000} \times 2,000\right) = 43,000
\]
Diff: 3
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Analytical skills
Nichols, Inc., manufactures remote controls. Currently the company uses a plant-wide rate for allocating manufacturing overhead. The plant manager believes it is time to refine the method of cost allocation and has the accounting department identify the primary production activities and their cost drivers:

<table>
<thead>
<tr>
<th>Activities</th>
<th>Cost driver</th>
<th>Allocation Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material handling</td>
<td>Number of parts</td>
<td>$2 per part</td>
</tr>
<tr>
<td>Assembly</td>
<td>Labor hours</td>
<td>$20 per hour</td>
</tr>
<tr>
<td>Inspection</td>
<td>Time at inspection station</td>
<td>$3 per minute</td>
</tr>
</tbody>
</table>

The current traditional cost method allocates overhead based on direct manufacturing labor hours using a rate of $200 per labor hour.

24) What are the indirect manufacturing costs per remote control assuming the traditional method is used and a batch of 500 remote controls are produced? The batch requires 1,000 parts, 10 direct manufacturing labor hours, and 15 minutes of inspection time.
A) $2,000.00 per remote control  
B) $0.25 per remote control  
C) $2.00 per remote control  
D) $4.00 per remote control  
Answer: D  
Explanation: D) 10 hours × $200 = $2,000 per batch / 500 units per batch = $4.00 per unit  
Diff: 2  
Terms: activity-based costing (ABC)  
Objective: 5  
AACSB: Analytical skills

25) What are the indirect manufacturing costs per remote control assuming an activity-based-costing method is used and a batch of 50 remote controls are produced? The batch requires 100 parts, 6 direct manufacturing labor hours, and 2.5 minutes of inspection time.
A) $4.00 per remote control  
B) $6.55 per remote control  
C) $24.00 per remote control  
D) $327.50 per remote control  
Answer: B  
Explanation: B) ($2 × 100) + ($20 × 6) + ($3 × 2.5) = $327.50 per batch / 50 units per batch = $6.55 per unit  
Diff: 2  
Terms: activity-based costing (ABC)  
Objective: 5  
AACSB: Analytical skills
26) What are the indirect manufacturing costs per remote control assuming an activity-based-costing method is used and a batch of 100 remote controls are produced? The batch requires 500 parts, 10 direct manufacturing labor hours, and 5 minutes of inspection time.
A) $12.15 per remote control
B) $1215 per remote control
C) $24.30 per remote control
D) $48.60 per remote control
Answer: A
Explanation: A) ($2 × 500) + ($20 × 10) + ($3 × 5) = $1215.00 per batch/100 units per batch = $12.15 per unit
Diff: 2
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Analytical skills

Answer the following questions using the information below:

Gregory Enterprises has identified three cost pools to allocate overhead costs. The following estimates are provided for the coming year:

<table>
<thead>
<tr>
<th>Cost Pool</th>
<th>Overhead Costs</th>
<th>Cost driver</th>
<th>Activity level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervision of direct labor</td>
<td>$320,000</td>
<td>Direct labor-hours</td>
<td>800,000</td>
</tr>
<tr>
<td>Machine maintenance</td>
<td>$120,000</td>
<td>Machine-hours</td>
<td>960,000</td>
</tr>
<tr>
<td>Facility rent</td>
<td>$200,000</td>
<td>Square feet of area</td>
<td>100,000</td>
</tr>
<tr>
<td>Total overhead costs</td>
<td>$640,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The accounting records show the Mossman Job consumed the following resources:

<table>
<thead>
<tr>
<th>Cost driver</th>
<th>Actual level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor-hours</td>
<td>200</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>1,600</td>
</tr>
<tr>
<td>Square feet of area</td>
<td>50</td>
</tr>
</tbody>
</table>

27) If Gregory Enterprises uses the three activity cost pools to allocate overhead costs, what are the activity-cost driver rates for supervision of direct labor, machine maintenance, and facility rent, respectively?
A) $0.60 per dlh, $0.025 per mh, $0.80 per sq ft
B) $1.25 per dlh, $0.25 per mh, $0.50 per sq ft
C) $0.40 per dlh, $0.05 per mh, $0.20 per sq ft
D) $0.40 per dlh, $0.125 per mh, $2 per sq ft
Answer: D
Explanation: D) Supervision cost driver rate is $0.40 per dlh = $320,000 / 800,000 dlh
Machine maintenance cost driver rate is $0.125 per mh = $120,000 / 960,000 mh
Facility rent cost driver rate is $2 per sq ft = $200,000 / 100,000 sq ft
Diff: 2
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Analytical skills
28) Using the three cost pools to allocate overhead costs, what is the total amount of overhead costs to be allocated to the Mossman Job?
A) $200
B) $380
C) $675
D) $170
Answer: B
Explanation: B) $380 = (200 × $0.40 per dlh) + (1,600 × $0.125 per mh) + (50 × $2 per sq ft)
Diff: 2
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Analytical skills
Answer the following questions using the information below:

Velshi Printers has contracts to complete weekly supplements required by forty-six customers. For the year 2010, manufacturing overhead cost estimates total $840,000 for an annual production capacity of 12 million pages.

For 2010 Velshi Printers has decided to evaluate the use of additional cost pools. After analyzing manufacturing overhead costs, it was determined that number of design changes, setups, and inspections are the primary manufacturing overhead cost drivers. The following information was gathered during the analysis:

<table>
<thead>
<tr>
<th>Cost pool</th>
<th>Manufacturing overhead costs</th>
<th>Activity level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design changes</td>
<td>$120,000</td>
<td>300 design changes</td>
</tr>
<tr>
<td>Setups</td>
<td>640,000</td>
<td>5,000 setups</td>
</tr>
<tr>
<td>Inspections</td>
<td>80,000</td>
<td>8,000 inspections</td>
</tr>
<tr>
<td>Total</td>
<td>$840,000</td>
<td></td>
</tr>
</tbody>
</table>

During 2010, two customers, Money Managers and Hospital Systems, are expected to use the following printing services:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Money Managers</th>
<th>Hospital Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pages</td>
<td>60,000</td>
<td>76,000</td>
</tr>
<tr>
<td>Design changes</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Setups</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Inspections</td>
<td>30</td>
<td>38</td>
</tr>
</tbody>
</table>

29) Assuming activity-cost pools are used, what are the activity-cost driver rates for design changes, setups, and inspections cost pools?
A) $400 per change, $128 per setup, $10 per inspection
B) $360 per change, $320 per setup, $6.40 per inspection
C) $168 per change, $538 per setup, $42 per inspection
D) $286 per change, $152 per setup, $20 per inspection

Answer: A

Explanation:
A) Design changes: $400 per change = ($120,000 / 300 design changes)
Setups: $128 per setup = ($640,000 / 5,000 setups)
Inspections: $10 per inspection = ($80,000 / 8,000 inspections)
Diff: 2
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Analytical skills
30) Using the three cost pools to allocate overhead costs, what is the total manufacturing overhead cost estimate for Money Managers during 2010?

A) $13,700
B) $6,500
C) $6,860
D) $10,192

Answer: C

Explanation:
C) $6,860 = (10 × $400 per change = $4,000) + (20 × $128 per setup = $2,560) + (30 × $10 per inspection = $300)

Diff: 3

Terms: activity-based costing (ABC)
Objective: 5
AACSB: Analytical skills
Answer the following questions using the information below:

Whitman Printing has contracts to complete weekly supplements required by forty-six customers. For the year 20X5, manufacturing overhead cost estimates total $840,000 for an annual production capacity of 12 million pages.

For 2010 Whitman Printing decided to evaluate the use of additional cost pools. After analyzing manufacturing overhead costs, it was determined that number of design changes, setups, and inspections are the primary manufacturing overhead cost drivers. The following information was gathered during the analysis:

<table>
<thead>
<tr>
<th>Cost pool</th>
<th>Manufacturing overhead costs</th>
<th>Activity level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design changes</td>
<td>$120,000</td>
<td>200 design changes</td>
</tr>
<tr>
<td>Setups</td>
<td>640,000</td>
<td>4,000 setups</td>
</tr>
<tr>
<td>Inspections</td>
<td>80,000</td>
<td>16,000 inspections</td>
</tr>
<tr>
<td>Total</td>
<td>$840,000</td>
<td></td>
</tr>
</tbody>
</table>

During 2010, two customers, Money Managers and Hospital Systems, are expected to use the following printing services:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Money Managers</th>
<th>Hospital Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pages</td>
<td>60,000</td>
<td>76,000</td>
</tr>
<tr>
<td>Design</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Setups</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Inspections</td>
<td>30</td>
<td>38</td>
</tr>
</tbody>
</table>

31) Assuming activity-cost pools are used, what are the activity-cost driver rates for design changes, setups, and inspections cost pools?
A) $600 per change, $160 per setup, $5.00 per inspection  
B) $500 per change, $400 per setup, $7.50 per inspection  
C) $420 per change, $210 per setup, $52.50 per inspection  
D) $666 per change, $250 per setup, $8.00 per inspection  
Answer: A  
Explanation:  
A) Design changes: $600 per change = ($120,000 / 200 design changes)  
Setups: $160 per setup = ($640,000 / 4,000 setups)  
Inspections $5.00 per inspection = ($80,000 / 16,000 inspections)  
Diff: 2  
Terms: activity-based costing (ABC)  
Objective: 5  
AACSB: Analytical skills
32) Using the activity-cost driver rates determined in the previous question, what is the manufacturing overhead cost estimate for Hospital Systems during 2010?
A) $6,227.50  
B) $2,990.00  
C) $4,136.00  
D) $6,825.00
Answer: B  
Explanation: B) $2,990 = (2 \times $600 per change) + (10 \times $160 per setup) + (38 \times $5.00 per inspection)  
Diff: 3  
Terms: activity-based costing (ABC)  
Objective: 5  
AACSB: Analytical skills

33) Availability of reliable data and measures should be considered when choosing a cost-allocation base.
Answer: TRUE  
Diff: 1  
Terms: activity-based costing (ABC)  
Objective: 5  
AACSB: Reflective thinking

34) When designing a costing system, it is easiest to calculate per-unit costs first, and then total costs.
Answer: FALSE  
Explanation: When designing a costing system, it is easiest to calculate total costs first, and then per-unit costs.  
Diff: 1  
Terms: activity-based costing (ABC)  
Objective: 5  
AACSB: Reflective thinking

35) ABC systems attempt to trace more costs as indirect costs.
Answer: FALSE  
Explanation: ABC systems attempt to trace more costs as direct costs.  
Diff: 1  
Terms: activity-based costing (ABC)  
Objective: 5  
AACSB: Reflective thinking

36) ABC systems create heterogeneous cost pools linked to different activities.
Answer: FALSE  
Explanation: ABC systems create homogeneous cost pools linked to different activities.  
Diff: 1  
Terms: activity  
Objective: 5  
AACSB: Reflective thinking
37) ABC systems seek a cost allocation base that has a cause-and-effect relationship with costs in the cost pool.
Answer: TRUE
Diff: 1
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Reflective thinking

38) For service organizations, activity-based cost systems may be used to clarify appropriate cost assignments.
Answer: TRUE
Diff: 1
Terms: activity-based costing (ABC)
Objective: 5
AACSB: Use of Information Technology

39) For each of the following activities identify an appropriate activity-cost driver.
   a. machine maintenance
   b. machine setup
   c. quality control
   d. material ordering
   e. production scheduling
   f. warehouse expense
   g. engineering design

Answer: Any one of the listed cost drivers is correct.

<table>
<thead>
<tr>
<th>Activity</th>
<th># of items</th>
<th>Delta time</th>
<th>Activity details</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Machine Maintenance</td>
<td># of machines</td>
<td>Machine hours</td>
<td>Actual times for various maintenances of various machines</td>
</tr>
<tr>
<td>B. Machine Setup</td>
<td># of setups</td>
<td>Setup hours</td>
<td>Actual times for various setups for various machines</td>
</tr>
<tr>
<td>C. Quality Control</td>
<td># of inspections</td>
<td>Inspection hours</td>
<td>Actual times for various inspections for various controls</td>
</tr>
<tr>
<td>D. Material Ordering</td>
<td># of orders</td>
<td>Ordering hours</td>
<td>Actual times for various orders for various materials</td>
</tr>
<tr>
<td>E. Production Scheduling</td>
<td># of runs</td>
<td>Scheduling hours</td>
<td>Actual times for various runs for various schedules</td>
</tr>
<tr>
<td>F. Warehousing</td>
<td># of bins, aisles</td>
<td>Picking hours</td>
<td>Actual times for various parts for various warehousing activities</td>
</tr>
<tr>
<td>G. Engineering Design</td>
<td># of engineers</td>
<td>Engineering hours</td>
<td>Actual times for various engineering designs</td>
</tr>
</tbody>
</table>

Diff: 2
Terms: activity
Objective: 3, 5
AACSB: Analytical skills
Objective 5.6

Answer the following questions using the information below:

Gregory Enterprises has identified three cost pools to allocate overhead costs. The following estimates are provided for the coming year:

<table>
<thead>
<tr>
<th>Cost Pool</th>
<th>Overhead Costs</th>
<th>Cost driver</th>
<th>Activity level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervision of direct labor</td>
<td>$320,000</td>
<td>Direct labor-hours</td>
<td>800,000</td>
</tr>
<tr>
<td>Machine maintenance</td>
<td>$120,000</td>
<td>Machine-hours</td>
<td>960,000</td>
</tr>
<tr>
<td>Facility rent</td>
<td>$200,000</td>
<td>Square feet of area</td>
<td>100,000</td>
</tr>
<tr>
<td>Total overhead costs</td>
<td>$640,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The accounting records show the Mossman Job consumed the following resources:

<table>
<thead>
<tr>
<th>Cost driver</th>
<th>Actual level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor-hours</td>
<td>200</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>1,600</td>
</tr>
<tr>
<td>Square feet of area</td>
<td>50</td>
</tr>
</tbody>
</table>

1) Which method of allocation probably best estimates actual overhead costs used? Why?
A) Single direct labor-hours cost driver because it is best to allocate total costs uniformly to individual jobs.
B) Single direct labor-hours cost driver because it is easiest to analyze and interpret.
C) Three activity-cost drivers because they best reflect the relative consumption of resources.
D) Three activity-cost drivers because product costs can be significantly cross-subsidized.
Answer: C
Diff: 2
Terms: activity-based costing (ABC)
Objective: 6
AACSB: Reflective thinking

2) It only makes sense to implement an ABC system when:
A) ABC provides information to make better decisions
B) its benefits exceed implementation costs
C) ABC traces more costs as direct costs
D) there is a strong cause-and-effect relationship between costs in the cost pools and their cost-allocation bases
Answer: B
Diff: 1
Terms: activity-based costing (ABC)
Objective: 6
AACSB: Reflective thinking
3) Which of the following is a sign that an ABC system may be useful?
A) There are small amounts of indirect costs.
B) Products make diverse demands on resources because of differences in volume, process steps, batch size, or complexity.
C) Products a company is less suited to produce and sell show small profits.
D) Operations staff agrees with accountants about the costs of manufacturing and marketing products and services.
Answer: B
Diff: 2
Terms: activity-based costing (ABC)
Objective: 6
AACSB: Reflective thinking

4) Smaller cost distortions occur when the traditional systems' single indirect-cost rate and the activity-cost-driver rates:
A) use the same total costs for computations
B) are similar in proportion to each other
C) are more different than alike
D) use the same cost driver units
Answer: B
Diff: 2
Terms: activity-based costing (ABC)
Objective: 6
AACSB: Reflective thinking

5) Activity-based costing systems provide better product costs when they:
A) employ more activity-cost drivers
B) employ fewer activity-cost drivers
C) identify and cost more indirect cost differences among products
D) always yield more accurate product costs than traditional systems
Answer: C
Diff: 2
Terms: activity-based costing (ABC)
Objective: 6
AACSB: Reflective thinking

6) Factories producing a more varied and complex mix of products have higher costs than factories producing only a narrow range of products because:
A) more variations and complexities require more activities
B) they require more engineers
C) they require more direct laborers
D) they buy more robotics
Answer: A
Diff: 1
Terms: activity-based costing (ABC)
Objective: 6
AACSB: Reflective thinking
7) Which of the following is NOT a sign that a "smoothing out" costing system exists?
A) Operations managers don't use the data originated by the cost system.
B) Products that a company is well suited to make and sell show large profits.
C) New product variations have been added, but the cost system has not been upgraded.
D) The company loses bids they believe were priced competitively.
Answer: B
Diff: 1
Terms: activity-based costing (ABC)
Objective: 6
AACSB: Reflective thinking

Answer the following questions using the information below:

Cannady produces six products. Under their traditional cost system using one cost driver, SR6 costs $168.00 per unit. An analysis of the activities and their costs revealed that three cost drivers would be used under the new ABC system. The new cost of SR6 was determined to be $178.00 per unit.

8) The total amount of indirect costs assigned to product SR6 using the traditional method is ________ the total amount assigned using ABC.
A) more than
B) less than
C) identical to
D) None of these answers are correct.
Answer: B
Diff: 1
Terms: activity-based costing (ABC)
Objective: 6
AACSB: Analytical skills

9) Given this change in the cost:
A) SR6 will now command a higher sales price
B) SR6 has benefited from the new system
C) SR6 is definitely more accurately costed
D) the costing results for SR6 under the new system depend on the adequacy and quality of the estimated cost drivers and costs used by the system
Answer: D
Diff: 2
Terms: activity-based costing (ABC)
Objective: 6
AACSB: Analytical skills
Answer the following questions using the information below:

Chess Woods Limited produces two products: wooden chess pieces and wooden inlaid chess boards. Under their traditional cost system using one cost driver (direct manufacturing labor hours), the cost of a set of wooden chess pieces is $325.00. An analysis of the activities and their costs revealed that three cost drivers would be used under a new ABC system. These cost drivers would be equipment usage, storage area for the material, and type of woods used. The new cost of a set of chess pieces was determined to be $298.00 per set.

10) The total amount of indirect cost assigned to produce chess pieces using the traditional method is ______ the total amount assigned using ABC.
   A) more than
   B) less than
   C) identical to
   D) None of these answers are correct.
   Answer: A
   Diff: 1
   Terms: activity-based costing (ABC)
   Objective: 6
   AACSB: Analytical skills

11) Given this change in the cost structure:
   A) The costing results for chess pieces under the new system depend on the adequacy and quality of the estimated cost drivers and costs used by the system.
   B) Chess pieces have benefited from the new system.
   C) Chess pieces are definitely more accurately costed.
   D) Chess will now have a lower sales price.
   Answer: A
   Diff: 2
   Terms: activity-based costing (ABC)
   Objective: 6
   AACSB: Analytical skills

12) The goal of a properly constructed ABC system is to:
   A) have the most accurate cost system
   B) identify more indirect costs
   C) develop the best cost system for an economically reasonable cost
   D) have separate allocation rates for each department
   Answer: C
   Diff: 1
   Terms: activity-based costing (ABC)
   Objective: 6
   AACSB: Reflective thinking
13) ABC systems always provide decision-making benefits that exceed implementation costs.
Answer: FALSE
Explanation: ABC system decision-making benefits do not always exceed implementation costs. This issue needs to be evaluated and if the costs exceed the benefits, then an ABC system should not be implemented.
Diff: 1
Terms: activity-based costing (ABC)
Objective: 6
AACSB: Ethical reasoning

14) The primary costs of an ABC system are the measurements necessary to implement the system.
Answer: TRUE
Diff: 1
Terms: activity-based costing (ABC)
Objective: 6
AACSB: Reflective thinking

15) Simply because activity-based costing systems employ more activity-cost drivers, they provide more accurate product costs than traditional systems.
Answer: FALSE
Explanation: When there are more activity-cost drivers, there is also more room for error, which may not result in more accurate products costs.
Diff: 2
Terms: activity-based costing (ABC)
Objective: 6
AACSB: Reflective thinking
16) Rachel's Pet Supply Corporation manufactures two models of grooming stations, a standard and a deluxe model. The following activity and cost information has been compiled:

<table>
<thead>
<tr>
<th>Product</th>
<th>Number of Setups</th>
<th>Number of Components</th>
<th>Number of Direct Labor Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard</td>
<td>3</td>
<td>30</td>
<td>650</td>
</tr>
<tr>
<td>Deluxe</td>
<td>7</td>
<td>50</td>
<td>150</td>
</tr>
</tbody>
</table>

Overhead costs $40,000 $120,000

Assume a traditional costing system applies the $160,000 of overhead costs based on direct labor hours.

a. What is the total amount of overhead costs assigned to the standard model?
b. What is the total amount of overhead costs assigned to the deluxe model?

diff: 2

terms: activity-based costing (ABC)

Objective: 1, 3, 5, 6

AACSB: Analytical skills

Answer:

a. \( \frac{160,000}{650 + 150} \times 650 = 130,000 \)  

b. \( \frac{160,000}{650 + 150} \times 150 = 30,000 \)

c. Setups: \( \frac{40,000}{3 + 7} = 4,000 \)  
Components: \( \frac{120,000}{30 + 50} = 1,500 \)  
\( (4,000 \times 3) + (1,500 \times 30) = 57,000 \)

d. \( (4,000 \times 7) + (1,500 \times 50) = 103,000 \)

e. Because the products do not all require the same proportionate shares of the overhead resources of setup hours and components, the ABC system provides different results than the traditional system which allocates overhead costs on the basis of direct labor hours. The ABC system considers some important differences in overhead resource requirements and thus provides a better picture of the costs from each grooming table style, provided that the activity measures are fairly estimated.
17) Come-On-In Manufacturing produces two types of entry doors: Deluxe and Standard. The assignment basis for support costs has been direct labor dollars. For 2010, Come-On-In compiled the following data for the two products:

<table>
<thead>
<tr>
<th></th>
<th>Deluxe</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales units</td>
<td>$50,000</td>
<td>$400,000</td>
</tr>
<tr>
<td>Sales price per unit</td>
<td>$650.00</td>
<td>$475.00</td>
</tr>
<tr>
<td>Direct material and labor costs per unit</td>
<td>$180.00</td>
<td>$130.00</td>
</tr>
<tr>
<td>Manufacturing support costs per unit</td>
<td>$ 80.00</td>
<td>$120.00</td>
</tr>
</tbody>
</table>

Last year, Come-On-In Manufacturing purchased an expensive robotics system to allow for more decorative door products in the deluxe product line. The CFO suggested that an ABC analysis could be valuable to help evaluate a product mix and promotion strategy for the next sales campaign. She obtained the following ABC information for 2010:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cost Driver</th>
<th>Cost</th>
<th>Total</th>
<th>Deluxe</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setups</td>
<td>of setups</td>
<td>$ 500,000</td>
<td>500</td>
<td>400</td>
<td>100</td>
</tr>
<tr>
<td>Machine-related of machine hours</td>
<td>$44,000,000</td>
<td>600,000</td>
<td>300,000</td>
<td>300,000</td>
<td></td>
</tr>
<tr>
<td>Packing</td>
<td>of shipments</td>
<td>$ 5,000,000</td>
<td>250,000</td>
<td>50,000</td>
<td>200,000</td>
</tr>
</tbody>
</table>

**Required:**

a. Using the current system, what is the estimated
   1. total cost of manufacturing one unit for each type of door?
   2. profit per unit for each type of door?

b. Using the current system, estimated manufacturing overhead costs per unit are less for the deluxe door ($80 per unit) than the standard door ($120 per unit). What is a likely explanation for this?

c. Review the machine-related costs above. What is a likely explanation for machine-related costs being so high? What might explain why total machining hours for the deluxe doors (300,000 hours) are the same as for the standard doors (300,000 hours)?

d. Using the activity-based costing data presented above,
   1. compute the cost-driver rate for each overhead activity.
   2. compute the revised manufacturing overhead cost per unit for each type of entry door.
   3. compute the revised total cost to manufacture one unit of each type of entry door.

e. Is the deluxe door as profitable as the original data estimated? Why or why not?

f. What considerations need to be examined when determining a sales mix strategy?
Answer:
a. Currently estimated deluxe-entry door total cost per unit is $260 = $180 + $80.
   Currently estimated standard-entry door total cost per unit is $250 = $130 + $120.

   Currently estimated deluxe-entry door profit per unit is $390 = $650 - $260.
   Currently estimated standard-entry door profit per unit is $225 = $475 - $250.

b. Support manufacturing costs are currently allocated based on direct labor dollars. Because the deluxe
doors are manufactured using the new robotics system, it appears that less direct labor is needed to
manufacture each unit in the deluxe product line.

c. The high machine-related costs are probably a result of purchasing the new robotics equipment for
the deluxe product line. Yes, the total number of machine hours is the same for each product line, but the
deluxe line uses 6 machine hours per unit (300,000 mh / 50,000 units), while the standard product line
only uses 0.75 machine hours per unit (300,000 mh / 400,000 units). By evaluating machine hours per
unit rather than total machine hours, these numbers make more sense.

d1. Manufacturing overhead cost driver rates:
   Setup activity is $1,000/setup = $500,000/500 setups.
   Machine-related activity is $73.33/machine hour = $44,000,000/600,000 machine hours.
   Packing activity is $20/shipment = $5,000,000/250,000 shipments.

d2. Revised overhead costs per unit:
   Deluxe-entry door is $468 per unit
   = [($1,000 \times 400) + ($73.33 \times 300,000) + ($20 \times 50,000)] / 50,000 units.
   Standard-entry door is $65.25 per unit
   = [($1,000 \times 100) + ($73.33 \times 300,000) + ($20 \times 200,000)] / 400,000 units.

d3. Revised total cost per unit for the deluxe-entry door is $648.00 = $180.00 + $468.00.
   Revised total cost per unit for the standard-entry door is $195.25 = $130.00 + $65.25.

e. No, the deluxe door is not as profitable as originally estimated because the deluxe door requires a
   disproportionate share of the overhead activities (the robotics system) and thus, more of the overhead
costs are assigned to the deluxe door when using an ABC system.
   Revised profit per unit for the deluxe-entry door is $2.00 = $650.00 - $648.00.
   Revised profit per unit for the standard-entry door is $279.75 = $475.00 - $195.25.
   Currently estimated deluxe-entry door profit per unit is $390 = $650 - $260.
   Currently estimated standard-entry door profit per unit is $225 = $475 - $250.

f. First, the sales-mix strategy ought to consider the current and future market demands for the two
types of entry doors. Other considerations include the capacity-related constraints of the robotics system,
other equipment, and the facilities. The fact that customers may be willing to pay more for the deluxe
doors should be considered when evaluating the profitability of each product line. Costs do not drive a
sales-mix strategy.

Diff: 3
Terms: activity-based costing (ABC)
Objective: 1, 3, 5, 6
AACSB: Analytical skills
Brilliant Accents Company manufactures and sells three styles of kitchen faucets: Brass, Chrome, and White. Production takes 25, 25, and 10 machine hours to manufacture 1,000-unit batches of brass, chrome, and white faucets, respectively. The following additional data apply:

<table>
<thead>
<tr>
<th>Projected sales in units</th>
<th>BRASS</th>
<th>CHROME</th>
<th>WHITE</th>
</tr>
</thead>
<tbody>
<tr>
<td>30,000</td>
<td>50,000</td>
<td>40,000</td>
<td></td>
</tr>
</tbody>
</table>

**PER UNIT data:**
- **Selling price**
  - Brass: $40
  - Chrome: $20
  - White: $30
- **Direct materials**
  - Brass: $8
  - Chrome: $4
  - White: $8
- **Direct labor**
  - Brass: $15
  - Chrome: $3
  - White: $9
- **Overhead cost based on direct labor hours**
  - Traditional system
    - Brass: $12
    - Chrome: $3
    - White: $9

<table>
<thead>
<tr>
<th>Hours per 1000-unit batch:</th>
<th>BRASS</th>
<th>CHROME</th>
<th>WHITE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor hours</td>
<td>40</td>
<td>10</td>
<td>30</td>
</tr>
<tr>
<td>Machine hours</td>
<td>25</td>
<td>25</td>
<td>10</td>
</tr>
<tr>
<td>Setup hours</td>
<td>1.0</td>
<td>0.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Inspection hours</td>
<td>30</td>
<td>20</td>
<td>20</td>
</tr>
</tbody>
</table>

Total overhead costs and activity levels for the year are estimated as follows:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Overhead costs</th>
<th>Activity levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor hours</td>
<td>2,900 hours</td>
<td></td>
</tr>
<tr>
<td>Machine hours</td>
<td>2,400 hours</td>
<td></td>
</tr>
<tr>
<td>Setups</td>
<td>$465,500</td>
<td>95 setup hours</td>
</tr>
<tr>
<td>Inspections</td>
<td>$405,000</td>
<td>2,700 inspection hours</td>
</tr>
<tr>
<td></td>
<td><strong>$870,500</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Required:**

a. Using the traditional system, determine the operating profit per unit for the brass style of faucet.

b. Determine the activity-cost-driver rate for setup costs and inspection costs.

c. Using the ABC system, for the brass style of faucet:
   1. Compute the estimated overhead costs per unit.
   2. Compute the estimated operating profit per unit.

d. Explain the difference between the profits obtained from the traditional system and the ABC system. Which system provides a better estimate of profitability? Why?
Answer:
a. Traditional system:
   Operating profit per unit for Brass faucets is $5 = $40 - ($8 + 15 + 12).

b. The activity-cost-driver rate for setup costs is $4,900 per setup hour = $465,500/95, and for inspection costs is $150 per inspection hour = $405,000/2,700.

c. ABC system:
   Overhead costs per unit for Brass faucets are $9.40 per unit.
   30,000 units in projected sales / 1000 units per batch = 30 batches;
   30 batches × 1 setup hour per batch = 30 setup hours;
   30 batches × 30 inspection hours per batch = 900 inspection hours.

   30 setup hours × $4,900 = $147,000/30,000 units = $4.90/unit
   900 inspection hours × $150 = $135,000/30,000 units = $4.50/unit
   Overhead costs for Brass faucets ($4.90 + $4.50) = $9.40 per unit.

   Operating profit per unit for Brass faucets is $7.60 = $40 - ($8 + 15 + 9.40).

d. Traditional system: Operating profit per unit for Brass faucets is $5.00.
   ABC system: Operating profit per unit for Brass faucets is $7.60.

   Because the products do not all require the same proportionate shares of the support resources of setup hours and inspection hours, the ABC system provides different results than the traditional system, which allocates overhead costs on the basis of direct labor hours. The ABC system considers some important differences in overhead resource requirements and thus provides a better picture of the profitability from each faucet style provided that the activity measures are fairly estimated.

Diff: 2
Terms: activity-based costing (ABC)
Objective: 1, 3, 5, 6
AACSB: Analytical skills
19) Brilliant Accents Company manufactures and sells three styles of kitchen faucets: Brass, Chrome, and White. Production takes 25, 25, and 10 machine hours to manufacture 1000-unit batches of brass, chrome and white faucets, respectively. The following additional data apply:

Projected sales in units: 30,000 for Brass, 50,000 for Chrome, and 40,000 for White.

**PER UNIT data:**
- **Selling price:** $40 for Brass, $20 for Chrome, $30 for White.
- **Direct materials:** $8 for Brass, $4 for Chrome, $8 for White.
- **Direct labor:** $15 for Brass, $3 for Chrome, $9 for White.
- **Overhead cost based on direct labor hours (traditional system):** $12 for Brass, $3 for Chrome, $9 for White.

**Hours per 1000-unit batch:**
- **Direct labor hours:** 40 for Brass, 10 for Chrome, 30 for White.
- **Machine hours:** 25 for Brass, 25 for Chrome, 10 for White.
- **Setup hours:** 1.0 for Brass, 0.5 for Chrome, 1.0 for White.
- **Inspection hours:** 30 for Brass, 20 for Chrome, 20 for White.

Total overhead costs and activity levels for the year are estimated as follows:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Overhead costs</th>
<th>Activity levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor hours</td>
<td>2,900 hours</td>
<td></td>
</tr>
<tr>
<td>Machine hours</td>
<td>2,400 hours</td>
<td></td>
</tr>
<tr>
<td>Setups</td>
<td>$465,500</td>
<td>95 setup hours</td>
</tr>
<tr>
<td>Inspections</td>
<td>$405,000</td>
<td>2,700 inspection hours</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$870,500</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Required:**

a. Using the traditional system, determine the operating profit per unit for each style of faucet.

b. Determine the activity-cost-driver rate for setup costs and inspection costs.

c. Using the ABC system, for each style of faucet
   1. compute the estimated overhead costs per unit.
   2. compute the estimated operating profit per unit.

d. Explain the differences between the profits obtained from the traditional system and the ABC system. Which system provides a better estimate of profitability? Why?
Answer:
a. Traditional system:
   Operating profit per unit for Brass faucets is $5 = $40 - ($8 + $15 + $12)
   Operating profit per unit for Chrome faucets is $10 = $20 - ($4 + $3 + $3)
   Operating profit per unit for White faucets is $4 = $30 - ($8 + $9 + $9)

b. The activity-cost-driver rate for setup costs is $4,900 per setup hour = $465,500/95, and for inspection costs is $150 per inspection hour = $405,000/2,700.

c. ABC system:
   Overhead costs per unit for Brass faucets are $9.40 per unit.
   30,000 units in projected sales / 1,000 units per batch = 30 batches;
   30 batches × 1 setup hour per batch = 30 setup hours;
   30 setup hours × $4,900 = $147,000/30,000 units = $4.90/unit
   900 inspection hours × $150 = $135,000/30,000 units = $4.50/unit
   Overhead costs for Brass faucets ($4.90 + $4.50) = $9.40 per unit

   Overhead costs per unit for Chrome faucets are $5.45 per unit.
   50,000 units in projected sales / 1,000 units per batch = 50 batches;
   50 batches × .5 setup hour per batch = 25 setup hours;
   50 batches × 20 inspection hours per batch = 1,000 inspection hours
   25 setup hours × $4,900 = $122,500/50,000 units = $2.45/unit
   1,000 inspection hours × $150 = $150,000/50,000 units = $3.00/unit
   Overhead costs for Chrome faucets ($2.45 + $3.00) = $5.45 per unit

   Overhead costs per unit for White faucets are $7.90 per unit.
   40,000 units in projected sales/1,000 units per batch = 40 batches;
   40 batches × 1 setup hour per batch = 40 setup hours;
   40 batches × 20 inspection hours per batch = 800 inspection hours
   40 setup hours × $4,900 = $196,000/40,000 units = $4.90/unit
   800 inspection hours × $150 = $120,000/40,000 units = $3.00/unit
   Overhead costs for white faucets ($4.90 + $3.00) = $7.90 per unit.

   Operating profit per unit for White faucets is $5.10 = $30 - ($8 + $9 + $7.90).
d. Traditional system:
   Operating profit per unit for Brass faucets is $5 = $40 - ($8 + $15 + $12).
   Operating profit per unit for Chrome faucets is $10 = $20 - ($4 + $3 + $3).
   Operating profit per unit for White faucets is $4 = $30 - ($8 + $9 + $9).

   ABC system:
   Operating profit per unit for Brass faucets is $7.60 = $40 - ($8 + $15 + $9.40).
   Operating profit per unit for Chrome faucets is $7.55 = $20 - ($4 + $3 + $5.45).
   Operating profit per unit for White faucets is $5.10 = $30 - ($8 + $9 + $7.90).

   Because the products do not all require the same proportionate shares of the overhead resources
of setup hours and inspection hours, the ABC system provides different results than the traditional
system, which allocates overhead costs on the basis of direct labor hours. The ABC system considers
some important differences in overhead resource requirements and thus provides a better picture of the
profitability from each faucet style provided that the activity measures are fairly estimated.

Diff: 3
Terms: activity-based costing (ABC)
Objective: 1, 3, 5, 6
AACSB: Analytical skills
20) Aunt Ethel's Fancy Cookie Company manufactures and sells three flavors of cookies: Macaroon, Sugar, and Buttercream. The batch size for the cookies is limited to 1,000 cookies based on the size of the ovens and cookie molds owned by the company. Based on budgetary projections, the information listed below is available:

Projected sales in units:  
- Macaroon: 500,000
- Sugar: 800,000
- Buttercream: 600,000

**PER UNIT data:**
- Selling price: Macaroon $0.80, Sugar $0.75, Buttercream $0.60
- Direct materials: Macaroon $0.20, Sugar $0.15, Buttercream $0.14
- Direct labor: Macaroon $0.04, Sugar $0.02, Buttercream $0.02

**Hours per 1000-unit batch:**
- Direct labor hours: Macaroon 2, Sugar 1, Buttercream 1
- Oven hours: Macaroon 1, Sugar 1, Buttercream 1
- Packaging hours: Macaroon 0.5, Sugar 0.5, Buttercream 0.5

Total overhead costs and activity levels for the year are estimated as follows:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Overhead costs</th>
<th>Activity levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor</td>
<td>$210,000</td>
<td>2,400 hours</td>
</tr>
<tr>
<td>Oven</td>
<td>$150,000</td>
<td>1,900 oven hours</td>
</tr>
<tr>
<td>Packaging</td>
<td>$150,000</td>
<td>950 packaging hours</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$360,000</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Required:**

a. Determine the activity-cost-driver rate for packaging costs.

b. Using the ABC system, for the sugar cookie:
   1. compute the estimated overhead costs per thousand cookies.
   2. compute the estimated operating profit per thousand cookies.

c. Using a traditional system (with direct labor hours as the overhead allocation base), for the sugar cookie:
   1. compute the estimated overhead costs per thousand cookies.
   2. compute the estimated operating profit per thousand cookies.

d. Explain the difference between the profits obtained from the traditional system and the ABC system. Which system provides a better estimate of profitability? Why?
Answer:

a.  
\[
\text{activity-cost-driver rate} = \frac{\text{packaging overhead}}{\text{packaging hours}} = \frac{$150,000}{950 \text{ hours}} = $157.89 \text{ per packaging hour}
\]

b.  
1. To compute the estimated overhead costs for a batch of sugar cookies (using the ABC system), first calculate the activity-cost-driver rate for the oven activity.

\[
\text{activity-cost-driver rate} = \frac{\text{oven overhead}}{\text{oven hours}} = \frac{$210,000}{1,900 \text{ hours}} = $110.53 \text{ per oven hour}
\]

Then calculate the overhead for a 1,000 cookie batch by multiplying the number of activity hours per batch by the appropriate activity-cost-driver rate for each of the relevant overhead activities and sum to get the total overhead for the batch.

\[
(1 \times $110.53) + (.5 \times $157.89) = $189.48
\]

2. To compute the estimated operating profit for a batch of sugar cookies (using the ABC system), subtract the costs from the revenues:

\[
\begin{align*}
\text{Revenue} &= 1,000 \times $0.75 = $750.00 \\
\text{Direct Material} &= 1,000 \times $0.015 = ($150.00) \\
\text{Direct Labor} &= 1,000 \times $0.02 = ($20.00) \\
\text{Overhead} &= ($189.48) \\
\text{Operating Profit} &= $390.52
\end{align*}
\]

c.  
1. To compute the estimated overhead costs for a batch of sugar cookies (using the traditional system), first calculate the overhead rate per direct labor hour.

\[
\text{Overhead per direct labor hour} = \frac{\text{Total Overhead}}{\text{Total Direct Labor Hours}} = \frac{$360,000}{2,400 \text{ hours}} = $150.00 \text{ per direct labor hour}
\]

Since it takes 1 direct labor hour per 1,000 sugar cookies, the overhead is $150.00

2. To compute the estimated operating profit for a batch of sugar cookies (using the traditional system), subtract the costs from the revenues:

\[
\begin{align*}
\text{Revenue} &= 1,000 \times $0.75 = $750.00 \\
\text{Direct Material} &= 1,000 \times $0.015 = ($150.00) \\
\text{Direct Labor} &= 1,000 \times $0.02 = ($20.00) \\
\text{Overhead} &= ($150.00) \\
\text{Operating Profit} &= $430.00
\end{align*}
\]
d. Traditional system: Operating profit per batch of sugar cookies is $430.00.  
   ABC system: Operating profit per batch of sugar cookies is $390.52.

Because the products do not all require the same proportionate shares of the direct labor resources,  
the allocation of the total overhead on that basis is not as accurate as using the ABC system. The ABC  
system allocates the overhead based on activity levels for the specific categories as well as activity usage  
by the product lines.

Diff: 2  
Terms: activity-based costing (ABC)  
Objective: 1, 3, 5, 6  
AACSB: Analytical skills
Objective 5.7

Answer the following questions using the information below:

Velshi Printers has contracts to complete weekly supplements required by forty-six customers. For the year 2010, manufacturing overhead cost estimates total $840,000 for an annual production capacity of 12 million pages.

For 2010 Velshi Printers has decided to evaluate the use of additional cost pools. After analyzing manufacturing overhead costs, it was determined that number of design changes, setups, and inspections are the primary manufacturing overhead cost drivers. The following information was gathered during the analysis:

<table>
<thead>
<tr>
<th>Cost pool</th>
<th>Manufacturing overhead costs</th>
<th>Activity level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design changes</td>
<td>$120,000</td>
<td>300 design changes</td>
</tr>
<tr>
<td>Setups</td>
<td>640,000</td>
<td>5,000 setups</td>
</tr>
<tr>
<td>Inspections</td>
<td>80,000</td>
<td>8,000 inspections</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$840,000</strong></td>
<td></td>
</tr>
</tbody>
</table>

During 2010, two customers, Money Managers and Hospital Systems, are expected to use the following printing services:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Money Managers</th>
<th>Hospital Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pages</td>
<td>60,000</td>
<td>76,000</td>
</tr>
<tr>
<td>Design changes</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Setups</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Inspections</td>
<td>30</td>
<td>38</td>
</tr>
</tbody>
</table>

1) When costs are assigned using the single cost driver, number of pages printed, then:
A) Velshi Printers will want to retain this highly profitable customer
B) Money Managers will likely seek to do business with competitors
C) Money Managers is unfairly over billed for its use of printing resources
D) Money Managers is grossly under billed for the job, while other jobs will be unfairly over billed

Answer: D

Diff: 3

Terms: activity-based costing (ABC)
Objective: 7
AACSB: Analytical skills
Whitman Printing has contracts to complete weekly supplements required by forty-six customers. For the year 20X5, manufacturing overhead cost estimates total $840,000 for an annual production capacity of 12 million pages.

For 2010 Whitman Printing decided to evaluate the use of additional cost pools. After analyzing manufacturing overhead costs, it was determined that number of design changes, setups, and inspections are the primary manufacturing overhead cost drivers. The following information was gathered during the analysis:

<table>
<thead>
<tr>
<th>Cost pool</th>
<th>Manufacturing overhead costs</th>
<th>Activity level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Design changes</td>
<td>$ 120,000</td>
<td>200 design changes</td>
</tr>
<tr>
<td>Setups</td>
<td>640,000</td>
<td>4,000 setups</td>
</tr>
<tr>
<td>Inspections</td>
<td>80,000</td>
<td>16,000 inspections</td>
</tr>
<tr>
<td>Total manufacturing overhead costs</td>
<td>$840,000</td>
<td></td>
</tr>
</tbody>
</table>

During 2010, two customers, Money Managers and Hospital Systems, are expected to use the following printing services:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Money Managers</th>
<th>Hospital Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pages</td>
<td>60,000</td>
<td>76,000</td>
</tr>
<tr>
<td>Design changes</td>
<td>10</td>
<td>2</td>
</tr>
<tr>
<td>Setups</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Inspections</td>
<td>30</td>
<td>38</td>
</tr>
</tbody>
</table>

2) When costs are assigned using the single cost driver, number of pages printed, then Hospital Systems:
A) is fairly billed because resources are allocated uniformly to all jobs
B) is grossly under billed for the job, while other jobs will be unfairly over billed
C) will likely seek to do business with competitors
D) will contribute too little to profits, and Wallace Printing will not want to accept additional work from the company
Answer:  C
Diff:  3
Terms: activity-based costing (ABC)
Objective:  7
AACSB: Analytical skills

3) Activity-based-costing information:
A) should be used when services place similar demands on resources
B) usually results in peanut-butter costing
C) will yield inaccurate cost numbers when products are similar
D) may assist in improving product design and efficiency
Answer:  D
Diff:  2
Terms: activity-based management (ABM)
Objective:  7
AACSB: Reflective thinking
4) Activity-based management (ABM) includes decisions about all EXCEPT:
A) pricing and product mix  
B) smoothing costs  
C) reducing costs  
D) improving processes  
Answer: B  
Diff: 1  
Terms: activity-based management (ABM)  
Objective: 7  
AACSB: Reflective thinking

5) ABC systems:
A) reveal activities that can be eliminated  
B) help control nonfinancial items such as number of setup hours  
C) help identify new designs to reduce costs  
D) All of these answers are correct.  
Answer: D  
Diff: 1  
Terms: activity-based management (ABM)  
Objective: 7  
AACSB: Reflective thinking

6) Companies use ABC system information to:
A) analyze costs  
B) prepare budgets  
C) evaluate performance  
D) All of these answers are correct.  
Answer: D  
Diff: 1  
Terms: activity-based management (ABM)  
Objective: 7  
AACSB: Reflective thinking

7) It is important that the product costs reflect as much of the diversity and complexity of the manufacturing process so that:
A) product costs will reflect their relative consumption of resources  
B) nonvalue-added costs can be eliminated  
C) there is less likelihood of cross subsidizing of product costs  
D) All of these answers are correct.  
Answer: D  
Diff: 1  
Terms: activity-based management (ABM)  
Objective: 7  
AACSB: Reflective thinking
8) A well-designed, activity-based cost system helps managers make better decisions because information derived from an ABC analysis:
A) can be used to eliminate nonvalue-added activities
B) is easy to analyze and interpret
C) takes the choices and judgment challenges away from the managers
D) emphasizes how managers can achieve higher sales
Answer: A
Diff: 2
Terms: activity-based management (ABM)
Objective: 7
AACSB: Communication

9) A primary reason for assigning selling and distribution costs to products for analytical purposes is:
A) to justify a varied product mix
B) that controllers are required to assign all costs when valuing inventories
C) that different processes, products, and customers require different quantities of selling and distribution activities
D) that all indirect costs must be assigned
Answer: C
Diff: 2
Terms: activity-based management (ABM)
Objective: 7
AACSB: Reflective thinking

10) For service organizations that bill customers at a predetermined average rate, activity-based cost systems can help to:
A) clarify appropriate cost assignments for various service activities
B) identify the profitability of various service activities
C) Both A and B are correct.
D) None of these answers are correct.
Answer: C
Diff: 2
Terms: activity-based management (ABM)
Objective: 7
AACSB: Reflective thinking

11) ABC reveals opportunities to focus on value added activities.
Answer: TRUE
Diff: 1
Terms: activity-based management (ABM)
Objective: 7
AACSB: Analytical skills

12) Activity-based management refers to the use of information derived from ABC analysis to analyze and improve operations.
Answer: TRUE
Diff: 1
Terms: activity-based management (ABM)
Objective: 7
AACSB: Communication
13) Information derived from an ABC analysis might be used to eliminate nonvalue-added activities.  
Answer: TRUE  
Diff: 1  
Terms: activity-based management (ABM)  
Objective: 7  
AACSB: Analytical skills

14) ABC costing systems are primarily for use in manufacturing and marketing and NOT for design engineering.  
Answer: FALSE  
Explanation: Management can evaluate how its current product and process designs affect activities and costs as a way of identifying new designs to reduce costs.  
Diff: 1  
Terms: activity-based management (ABM)  
Objective: 7  
AACSB: Reflective thinking

Objective 5.8

1) Products make diverse demands on resources because of differences in all of the following EXCEPT:  
A) volume  
B) selling price  
C) batch size  
D) complexity  
Answer: B  
Diff: 2  
Terms: activity-based costing (ABC)  
Objective: 8  
AACSB: Reflective thinking

2) The unique feature of an ABC system is the emphasis on:  
A) costing individual jobs  
B) department indirect-cost rates  
C) multiple-cost pools  
D) individual activities  
Answer: D  
Diff: 3  
Terms: activity-based costing (ABC)  
Objective: 8  
AACSB: Reflective thinking
3) One department indirect-cost rate is sufficient when:
A) activities relate to more than one level of the cost hierarchy
B) product costs are significantly cross-subsidized
C) the same allocation base is appropriate for all departmental activities
D) it is a service department
Answer: C
Diff: 2
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Reflective thinking

Answer the following questions using the information below:

King Corporation has two departments, Small and Large. Central costs could be allocated to the two departments in various ways.

<table>
<thead>
<tr>
<th>Small Department</th>
<th>Large Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square footage</td>
<td>6,000</td>
</tr>
<tr>
<td>Number of employees</td>
<td>1,120</td>
</tr>
<tr>
<td>Sales</td>
<td>$400,000</td>
</tr>
</tbody>
</table>

4) If advertising expense of $300,000 is allocated on the basis of sales, the amount allocated to the Small Department would be:
A) $50,000
B) $75,000
C) $210,000
D) $250,000
Answer: A
Explanation: A) $300,000 × $400,000 / ($400,000 + $2,000,000) = $50,000
Diff: 2
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Analytical skills

5) If total advertising expense of $300,000 is allocated on the basis of sales, the amount allocated to the Large Department would be:
A) $225,000
B) $90,000
C) $250,000
D) $50,000
Answer: C
Explanation: C) $300,000 × $2,000,000 / ($400,000 + $2,000,000) = $250,000
Diff: 2
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Analytical skills
6) If total payroll processing costs of $96,000 are allocated on the basis of number of employees, the amount allocated to the Small Department would be:
   A) $67,200
   B) $24,000
   C) $16,000
   D) $28,000
   Answer: A
   Explanation: A) $96,000 × 1,120 / (1,120 + 480) = $67,200
   Diff: 2
   Terms: activity-based costing (ABC)
   Objective: 8
   AACSB: Analytical skills

7) If total payroll processing costs of $60,000 are allocated on the basis of number of employees, the amount allocated to the Large Department would be:
   A) $42,000
   B) $18,000
   C) $45,000
   D) $50,000
   Answer: B
   Explanation: B) $60,000 × 480 / (1,120 + 480) = $18,000
   Diff: 2
   Terms: activity-based costing (ABC)
   Objective: 8
   AACSB: Analytical skills

8) If total rent expense of $120,000 is allocated on the basis of square footage, the amount allocated to the Small Department would be:
   A) $20,000
   B) $30,000
   C) $84,000
   D) $90,000
   Answer: B
   Explanation: B) $120,000 × 6,000 / (6,000 + 18,000) = $30,000
   Diff: 2
   Terms: activity-based costing (ABC)
   Objective: 8
   AACSB: Analytical skills
9) If total rent expense of $288,000 is allocated on the basis of square footage, the amount allocated to the Large Department would be:
A) $86,400
B) $240,000
C) $72,000
D) $216,000
Answer: D
Explanation: D) $288,000 \times \frac{18,000}{(6,000 + 18,000)} = $216,000
Diff: 2
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Analytical skills

10) If administrative expense of $62,500 is allocated on the basis of number of employees, the amount allocated to the Truck Rental Department would be:
A) $37,500
B) $62,500
C) $46,875
D) $15,625
Answer: D
Explanation: D) $62,500 \times \frac{50}{(150+50)} = $15,625
Diff: 2
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Analytical skills

11) If administrative expense of $62,500 is allocated on the basis of number of employees, the amount allocated to the Car Rental Department would be:
A) $37,500
B) $62,500
C) $46,875
D) $15,625
Answer: C
Explanation: C) $62,500 \times \frac{150}{(150+50)} = $46,875
Diff: 2
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Analytical skills
12) If advertising expense of $75,000 is allocated on the basis of sales, the amount allocated to the Car Rental Department would be:
A) $50,000
B) $62,500
C) $25,000
D) $37,500
Answer: A
Explanation: A) $75,000 * [$75,000,000/($750,000+$375,000)] = $50,000
Diff: 2
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Analytical skills

13) If advertising expense of $112,500 is allocated on the basis of sales, the amount allocated to the Truck Rental Department would be:
A) $56,250
B) $62,500
C) $37,500
D) $87,500
Answer: C
Explanation: C) $112,500 * [$375,000/($750,000+$375,000)] = $37,500
Diff: 2
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Analytical skills

14) If the facility lease expense of $350,000 is allocated on the basis of vehicles in the fleet, the amount allocated to the Truck Rental Department would be:
A) $245,000
B) $105,000
C) $200,000
D) $150,000
Answer: B
Explanation: B) $350,000 * [300/(700+300)] = $105,000
Diff: 2
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Analytical skills

15) If the facility lease expense of $350,000 is allocated on the basis of vehicles in the fleet, the amount allocated to the Car Rental Department would be:
A) $245,000
B) $105,000
C) $200,000
D) $150,000
Answer: A
Diff: 2
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Analytical skills
16) Using activity-cost rates rather than department indirect-cost rates to allocate costs results in different product costs when:
A) a single activity accounts for a sizable portion of department costs
B) there are several homogeneous cost pools
C) different activities have the same cost-allocation base
D) different products use different resources in the same proportion
Answer: B
Diff: 2
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Reflective thinking

17) A key reason for using an ABC system rather than a department-costing system is because ABC assigns indirect costs:
A) using broader averages
B) more simply than a department-costing system
C) in a less costly manner
D) to reflect differences required by different processes as well as customers
Answer: D
Diff: 1
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Reflective thinking

18) ABC systems are a further refinement of department-costing systems.
Answer: TRUE
Diff: 1
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Reflective thinking

19) ABC systems are useful in manufacturing, but NOT in the merchandising or service industries.
Answer: FALSE
Explanation: ABC systems can be useful in manufacturing, merchandising, and service industries.
Diff: 1
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Reflective thinking

20) Costing systems with multiple cost pools are considered ABC systems.
Answer: FALSE
Explanation: The uniqueness of ABC systems is not simply multiple cost pools, but that the cost pools each relate to different activities.
Diff: 2
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Reflective thinking
21) Regarding department wide systems, the benefits of an ABC system must be balanced against its costs and limitations.
Answer: TRUE
Diff: 2
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Reflective thinking

22) At Deutschland Electronics, product lines are charged for call center support costs based on sales revenue. Last year's summary of call center operations revealed the following:

<table>
<thead>
<tr>
<th>Surveillance Products</th>
<th>Specialty Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of calls for information</td>
<td>1,000</td>
</tr>
<tr>
<td>Average call length for information</td>
<td>3 minutes</td>
</tr>
<tr>
<td>Number of calls for warranties</td>
<td>300</td>
</tr>
<tr>
<td>Average call length for warranties</td>
<td>7 minutes</td>
</tr>
<tr>
<td>Sales revenue</td>
<td>$8,000,000</td>
</tr>
</tbody>
</table>

Deutschland Electronics currently allocates call center support costs using a rate of 0.5% of sales revenue.

**Required:**
a. Compute the amount of call center support costs allocated to each product line under the current system.

b. Assume Deutschland decides to use the *average call length for information* to assign last year's support costs. Does this allocation method seem more appropriate than percentage of sales? Why or why not?

c. Assume Deutschland decides to use the *numbers of calls for information and for warranties* to assign last year's support costs of $65,000. Compute the amount of call center support costs assigned to each product line under this revised ABC system.

d. Deutschland Electronics assigns bonuses based on departmental profits. How might the Specialty Products manager try to obtain higher profits for next year if support costs are assigned based on the average call length for information?

e. Discuss the barriers for implementing ABC for this call center.
Answer:

a. Call center support costs allocated to surveillance products is $40,000 = 0.005 \times 8,000,000\) and to specialty products is $25,000 = 0.005 \times 5,000,000\).

b. Yes, average call length appears to be a more appropriate allocation method because it allocates more support costs to specialty products, which consume a greater portion of the call center's resources.

c. $65,000 of support costs / 6,500 total calls (Surveillance 1,000 + 300 + Specialty 4,000 + 1,200) = $10 per call. Call center support costs allocated to surveillance products is $13,000 = 1,300 calls \times $10 per call, and to specialty products is $52,000 = 5,200 calls \times $10 per call.

d. To increase profits, Specialty Product managers would want less cost allocated to their departments. Therefore, if support cost allocation were based on length of call, Specialty Products management may emphasize keeping calls for their department short and to the point, rather than emphasizing understanding and helping the caller.

e. Poor model design or poor analytical interpretation and accountability consequences may function as barriers to using ABC assignments for the call center activities. It is also important to recognize that the call volumes from this year may be an anomaly so that in an average year, the current allocation rate on sales may not be as distortive as it appears for this year.

Diff: 3

Terms: activity-based costing (ABC)
Objective: 1, 3, 5, 6, 8
AACSB: Analytical skills
23) The Guy Fawkes Company is noted for an exceptionally impressive line of Mardi Gras masks. Guy Fawkes has established the following selling and distribution support activity-cost pools and their corresponding activity drivers for the year 2010:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Cost</th>
<th>Cost driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marketing</td>
<td>$60,000</td>
<td>$500,000 of sales</td>
</tr>
<tr>
<td>Customer service</td>
<td>20,000</td>
<td>5,000 customer</td>
</tr>
<tr>
<td>Order execution</td>
<td>10,000</td>
<td>100 orders</td>
</tr>
<tr>
<td>Warehousing</td>
<td>10,000</td>
<td>50 product lines</td>
</tr>
</tbody>
</table>

**Required:**

a. Determine the activity-cost-driver rate for each of the four selling and distribution activities.
b. Under what circumstances is it appropriate to use each of the activity-cost drivers?
c. Describe at least one possible negative behavioral consequence for each of the four activity-cost drivers.

**Answer:**

a. Activity-cost driver rate for Marketing = 12% of sales = $60,000/$500,000.
   Activity-cost driver rate for Customer Service = $4 per customer = $20,000/5,000.
   Activity-cost driver rate for Order Execution = $100 per order = $10,000/100.
   Activity-cost driver rate for Warehousing = $200 per order = $10,000/50.

b. For marketing, using 12% of stipulated sales is appropriate when management wants to limit marketing costs to a budgeted proportion to sales. Using the number of customers for customer service is appropriate when the customer service costs are similar enough to use the average for all customers. Using the number of orders for order execution is appropriate when all orders are sufficiently alike in terms of resources used that they can be averaged. Using the number of product lines for warehousing is appropriate when each product line requires similar proportions of the warehousing efforts.

c. For marketing, using 12% of sales limits the marketing activities to an arbitrary amount without consideration for potential opportunities. Using the number of customers for customer service can lead to customer service initiatives to limit the amount of time servicing each customer to cause the number of customers serviced to increase. Using the number of orders for order execution can result in purchasers splitting orders to increase the numbers of orders executed. Using the number of product lines for warehousing can lead warehouse personnel to designate more product line differences in the warehouse.

Diff: 3
Terms: activity
Objective: 3, 5, 6, 8
AACSB: Analytical skills
24) How are cost drivers selected in activity-based costing systems?
Answer: First, indirect costs are divided into homogeneous cost pools and classified as output unit-level, batch-level, product-sustaining, or facility-sustaining costs. The cost pools correspond to activities. Costs are allocated to products, services, or customers using activity drivers or cost-allocation bases that have a cause-and-effect relationship with each cost pool.

Choices about how to economize on the number of activity-cost drivers, how to isolate events (because activities triggered by the same event often can use the same activity cost driver), and which cost drivers to select are influenced by the fact that the benefit of obtaining cost driver information needs to exceed implementation costs.
Diff: 2
Terms: activity
Objective: 3, 8
AACSB: Reflective thinking

25) Do activity-based costing systems always provide more accurate product costs than conventional cost systems? Why or why not?
Answer: No. Traditional systems contain smaller and fewer cost distortions when the traditional systems' unit-level assignments and the alternative activity-cost drivers are relatively similar in proportion to each other. Still, the use of unit-level measures to assign indirect costs is more likely to undercost low-volume products and more complex products. Both traditional product-costing systems and ABC product-costing systems seek to assign all manufacturing costs to products. Cost distortions occur when a mismatch (incorrect association) occurs between the way support costs are incurred and the basis for their assignment to individual products.
Diff: 2
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Reflective thinking

26) How can the need for a more refined costing system be identified?
Answer: Signs that there is a need for a more refined costing system include the following:
a. Significant amounts of indirect costs are allocated using only one or two cost pools.
b. All or most indirect costs are identified as output unit-level costs rather than batch-level, product-sustaining, or facility-sustaining activities.
c. Products make diverse demands on resources because of differences in volume, process steps, batch size, or complexity.
d. Products that a company is well suited to make and sell show small profits; whereas, products that a company is less suited to make and sell show large profits.
e. Operations staff have significant disagreements with the accounting staff about the costs of manufacturing and marketing products and services.
Diff: 2
Terms: activity-based costing (ABC)
Objective: 8
AACSB: Reflective thinking
27) What is activity-based management and how can it be used to improve the profitability of a company?

Answer: Activity-based management is a method of management decision making that uses activity-based costing information to improve customer satisfaction and profitability. Some of the typical issues that require a refined costing system (such as ABC) are pricing and product mix decisions, cost reduction initiatives, streamlining of processes, and decisions that can lead to improved product design based on knowledge of detailed costs of the existing product lines. The gathering of timely and accurate information is one of the crucial steps in the decision-making process. A properly designed ABC system will be likely to efficiently provide detailed costing information to managers in companies that manufacture and distribute diverse product lines.

Diff: 2
Terms: activity-based management (ABM)
Objective: 8
AACSB: Reflective thinking
Objective 6.1

1) A budget:
A) is the quantitative expression of a proposed plan of action by management
B) is an aid to coordinate what needs to be done
C) generally includes both financial and nonfinancial aspects of the plan
D) All of the above are correct.
Answer: D
Diff: 1
Terms: budget
Objective: 1
AACSB: Reflective thinking

2) A budget
A) is the quantitative expression of a proposed plan of action.
B) aids in coordinating what needs to be done.
C) includes both financial and nonfinancial aspects.
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: budget
Objective: 1
AACSB: Reflective thinking

3) Budgeting is used to help companies:
A) plan to better satisfy customers
B) anticipate potential problems
C) focus on opportunities
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: master budget
Objective: 1
AACSB: Communication

4) A master budget:
A) includes only financial aspects of a plan and excludes nonfinancial aspects
B) is an aid to coordinating what needs to be done to implement a plan
C) includes broad expectations and visionary results
D) should not be altered after it has been agreed upon
Answer: B
Diff: 2
Terms: master budget
Objective: 1
AACSB: Reflective thinking
5) Operating decisions primarily deal with:
A) the use of scarce resources
B) how to obtain funds to acquire resources
C) acquiring equipment and buildings
D) satisfying stockholders
Answer: A
Diff: 2
Terms: operating budget
Objective: 1
AACSB: Reflective thinking

6) Financing decisions primarily deal with:
A) the use of scarce resources
B) how to obtain funds to acquire resources
C) acquiring equipment and buildings
D) preparing financial statements for stockholders
Answer: B
Diff: 2
Terms: financial budget
Objective: 1
AACSB: Reflective thinking

7) Budgeting provides all of the following EXCEPT:
A) a means to communicate the organization's short-term goals to its members
B) support for the management functions of planning and coordination
C) a means to anticipate problems
D) an ethical framework for decision making
Answer: D
Diff: 2
Terms: master budget
Objective: 1
AACSB: Communication

8) If initial budgets prove UNACCEPTABLE, planners achieve the most benefit from:
A) planning again in light of feedback and current conditions
B) deciding not to budget this year
C) accepting an unbalanced budget
D) using last year's budget
Answer: A
Diff: 2
Terms: master budget
Objective: 1
AACSB: Communication
9) Operating budgets and financial budgets:
A) combined form the master budget
B) are prepared before the master budget
C) are prepared after the master budget
D) have nothing to do with the master budget
Answer: A
Diff: 1
Terms: operating budget, financial budget, master budget
Objective: 1
AACSB: Reflective thinking

10) A good budgeting system forces managers to examine the business as they plan, so they can:
A) detect inaccurate historical records
B) set specific expectations against which actual results can be compared
C) complete the budgeting task on time
D) get promoted for doing a good job
Answer: B
Diff: 2
Terms: master budget
Objective: 1
AACSB: Communication

11) A budget is the quantitative expression of a proposed plan of action by management for a specified period.
Answer: TRUE
Diff: 1
Terms: budget
Objective: 1
AACSB: Analytical skills

12) A budget generally includes both financial and nonfinancial aspects of the plan.
Answer: TRUE
Diff: 1
Terms: budget
Objective: 1
AACSB: Communication

13) Budgeted financial statements are also referred to as pro forma statements.
Answer: TRUE
Diff: 1
Terms: financial budget
Objective: 1
AACSB: Reflective thinking
14) Budgeting includes only the financial aspects of the plan and NOT any nonfinancial aspects such as the number of physical units manufactured.
Answer: FALSE
Explanation: Budgeting includes both financial and nonfinancial aspects of the plan.
Diff: 2
Terms: financial budget
Objective: 1
AACSB: Reflective thinking

15) Budgeting helps management anticipate and adjust for trouble spots in advance.
Answer: TRUE
Diff: 1
Terms: budget
Objective: 1
AACSB: Reflective thinking

16) Budgets can play both planning and control roles for management.
Answer: TRUE
Diff: 1
Terms: budget
Objective: 1
AACSB: Reflective thinking

17) Long-run planning and short-run planning are best performed independently of each other.
Answer: FALSE
Explanation: Long-run planning and short-run planning are best performed as a part of an overall strategic planning process since they influence each other.
Diff: 2
Terms: planning
Objective: 1
AACSB: Reflective thinking

18) Financing decisions deal with how to best use the limited resources of an organization.
Answer: FALSE
Explanation: Financing decisions deal with how to obtain the funds to acquire those resources.
Diff: 2
Terms: master budget
Objective: 1
AACSB: Ethical reasoning

19) Operating decisions deal with how to obtain the funds to acquire resources.
Answer: FALSE
Explanation: Financing decisions deal with obtaining funds.
Diff: 2
Terms: master budget
Objective: 1
AACSB: Ethical reasoning
20) Budgeted financial statements are called pro forma statements.
Answer: TRUE
Diff: 2
Terms: pro forma statements
Objective: 1
AACSB: Reflective thinking

21) Describe the benefits to an organization of preparing an operating budget.
Answer: A well-prepared operating budget should serve as a guide for a company to follow during the budgeted period. It is not "set in stone." If new information or opportunities arise, the budget should be adjusted.

A well-prepared operating budget assists management with the allocation of scarce resources. It can help management see trouble spots in advance, and then management can decide where to allocate its limited resources.

A well-prepared operating budget fosters communication and coordination among various segments of the company. The process of preparing a budget requires managers from different functional areas to work together and communicate performance levels they both want and can attain.

A well-prepared operating budget can become the performance standard against which firms can compare the actual results.
Diff: 2
Terms: operating budget
Objective: 1
AACSB: Reflective thinking

22) Bob and Dale have just purchased a small honey manufacturing company that was having financial difficulties. After a brief operating period, they decided that the company's main problem was the lack of any financial planning. The company made a good product and market potential was great.

**Required:**
Explain why a company needs a good budgeting plan. Specifically address the need for a master budget.
Answer: The master budget is a series of interrelated budgets that quantify management's expectations about a company's revenues, expenses, net income, cash flows, and financial position. When administered wisely, a budget:
- provides a framework for judging performance,
- motivates managers and employees, and
- promotes coordination and communication among subunits within the company.

Diff: 2
Terms: operating budget
Objective: 1
AACSB: Reflective thinking
Objective 6.2

1) A budget can do all of the following EXCEPT:
A) promote coordination among subunits
B) determine actual profitability
C) motivate managers
D) motivate employees
Answer: B
Diff: 2
Terms: budget
Objective: 2
AACSB: Reflective thinking

2) A budget should/can do all of the following EXCEPT:
A) be prepared by managers from different functional areas working independently of each other
B) be adjusted if new opportunities become available during the year
C) help management allocate limited resources
D) become the performance standard against which firms can compare the actual results
Answer: A
Diff: 3
Terms: master budget
Objective: 2
AACSB: Reflective thinking

3) A limitation of comparing a company's performance against actual results of last year is that:
A) it includes adjustments for future conditions
B) feedback is no longer a possibility
C) past results can contain inefficiencies of the past year
D) the budgeting time period is set at one year
Answer: C
Diff: 2
Terms: master budget
Objective: 2
AACSB: Reflective thinking

4) Challenging budgets tend to:
A) decrease line-management participation in attaining corporate goals
B) increase failure
C) increase anxiety without motivation
D) motivate improved performance
Answer: D
Diff: 2
Terms: master budget
Objective: 2
AACSB: Reflective thinking
5) Actual results should NOT be compared against past performance because:
A) past results may contain mistakes and substandard performance
B) past results will never happen again
C) past performance is an indicator of future performance
D) future conditions will be similar to past conditions
Answer: A
Diff: 2
Terms: master budget
Objective: 2
AACSB: Reflective thinking

6) A company's actual performance should be compared against budgeted amounts for the same accounting period so that:
A) adjustments for future conditions can be included
B) no feedback is possible
C) inefficiencies of the past year can be included
D) a rolling budget can be implemented
Answer: A
Diff: 2
Terms: master budget
Objective: 2
AACSB: Ethical reasoning

7) It is advantageous to coordinate budgets with:
A) suppliers
B) customers
C) the marketing and production departments
D) All of these answers are correct.
Answer: D
Diff: 3
Terms: master budget
Objective: 2
AACSB: Reflective thinking

8) A budget can help implement:
A) strategic planning
B) long-run planning
C) short-run planning
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: master budget
Objective: 2
AACSB: Reflective thinking
9) To gain the benefits of budgeting ________ must understand and support the budget.
A) senior management
B) middle management
C) line employees
D) All of these answers are correct.
Answer: D
Diff: 3
Terms: master budget
Objective: 2
AACSB: Communication

10) Participation of employees in the budgeting process helps to create:
A) greater commitment
B) greater anxiety
C) less commitment
D) better past performance
Answer: A
Diff: 2
Terms: master budget
Objective: 2
AACSB: Communication

11) Line managers who feel that top management does NOT believe in the budget are most likely to:
A) pick up the slack and participate in the budgeting process
B) be motivated by the budget
C) spend little time on the budgeting process
D) convert the budget to a shorter more reasonable time period
Answer: C
Diff: 2
Terms: master budget
Objective: 2
AACSB: Communication

12) The time coverage of a budget should be:
A) one year
B) guided by the purpose of the budget
C) cover design through manufacture and sale of the product
D) shorter rather than longer
Answer: B
Diff: 2
Terms: master budget
Objective: 2
AACSB: Reflective thinking
13) Rolling budgets help management to:
A) better review the past calendar year
B) deal with a 5-year time frame
C) focus on the upcoming budget period
D) rigidly administer the budget
Answer: C
Diff: 2
Terms: rolling budget
Objective: 2
AACSB: Reflective thinking

14) Budgets should:
A) be flexible
B) be administered rigidly
C) only be developed for short periods of time
D) include only variable costs
Answer: A
Diff: 2
Terms: master budget
Objective: 2
AACSB: Reflective thinking

15) After a budget is agreed upon and finalized by the management team, the amounts should NOT be
changed for any reason.
Answer: FALSE
Explanation: Budgets should not be administered rigidly, but rather should be adjusted for changing
conditions.
Diff: 2
Terms: master budget
Objective: 2
AACSB: Ethical reasoning

16) Even in the face of changing conditions, attaining the original budget is critical.
Answer: FALSE
Explanation: Changing conditions usually call for a change in plans. Attaining the budget should not be
an end in itself.
Diff: 3
Terms: master budget
Objective: 2
AACSB: Reflective thinking

17) Lower-level managers will not actively participate in the budget process if they perceive upper
management does NOT believe in the process.
Answer: TRUE
Diff: 3
Terms: master budget
Objective: 2
AACSB: Communication
18) Coordination is meshing and balancing all aspects of production or service and all departments in a company in the best way for the company to meet its goals.
Answer: TRUE
Diff: 2
Terms: coordination
Objective: 2
AACSB: Reflective thinking

19) Research shows that challenging budgets improve employee performance because employees view falling short of budgeted numbers as a failure.
Answer: TRUE
Diff: 2
Terms: master budget
Objective: 2
AACSB: Reflective thinking

20) It is best to compare this year's performance with last year's actual performance rather than this year's budget.
Answer: FALSE
Explanation: It is best to compare this year's performance with this year's budget because inefficiencies and different conditions may be reflected in last year's actual performance amounts.
Diff: 3
Terms: master budget
Objective: 2
AACSB: Reflective thinking

21) When administered wisely, budgets promote communication and coordination among the various subunits of the organization.
Answer: TRUE
Diff: 2
Terms: budget
Objective: 2
AACSB: Communication

Objective 6.3

1) Operating budgets include all of the following EXCEPT:
A) the revenues budget
B) the budgeted income statement
C) the administrative costs budget
D) the budgeted balance sheet
Answer: D
Diff: 1
Terms: operating budget
Objective: 3
AACSB: Reflective thinking
2) Operating budgets include the:
A) budgeted balance sheet
B) budgeted income statement
C) capital expenditures budget
D) budgeted statement of cash flows
Answer: B
Diff: 1
Terms: operating budget
Objective: 3
AACSB: Reflective thinking

3) The operating budget process generally concludes with the preparation of the:
A) production budget
B) distribution budget
C) research and development budget
D) budgeted income statement
Answer: D
Diff: 1
Terms: operating budget
Objective: 3
AACSB: Reflective thinking

4) Which budget is NOT necessary to prepare the budgeted balance sheet?
A) cash budget
B) budgeted statement of cash flows
C) budgeted income statement
D) revenues budget
Answer: B
Diff: 1
Terms: master budget
Objective: 3
AACSB: Reflective thinking

5) Financial budgets include the all of the following EXCEPT:
A) capital expenditures budget
B) budgeted income statement
C) budgeted balance sheet
D) budgeted statement of cash flows
Answer: B
Diff: 1
Terms: financial budget
Objective: 3
AACSB: Reflective thinking
6) ________ includes a budgeted statement of cash flows and a budgeted balance sheet.
A) An annual report
B) The financial budget
C) The operating budget
D) The capital expenditures budget
Answer: B
Diff: 1
Terms: financial budget
Objective: 3
AACSB: Reflective thinking

7) The order to follow when preparing the operating budget is:
A) revenues budget, production budget, and direct manufacturing labor costs budget
B) costs of goods sold budget, production budget, and cash budget
C) revenues budget, manufacturing overhead costs budget, and production budget
D) cash expenditures budget, revenues budget, and production budget.
Answer: A
Diff: 2
Terms: operating budget
Objective: 3
AACSB: Reflective thinking

8) In which order are the following developed? First to last:
   A = Production budget
   B = Direct materials costs budget
   C = Budgeted income statement
   D = Revenues budget
A) ABDC
B) DABC
C) DCAB
D) CABD
Answer: B
Diff: 2
Terms: operating budget
Objective: 3
AACSB: Reflective thinking

9) The budgeting process is most strongly influenced by:
A) the capital budget
B) the budgeted statement of cash flows
C) the sales forecast
D) the production budget
Answer: C
Diff: 2
Terms: operating budget
Objective: 3
AACSB: Reflective thinking
10) ________ is the usual starting point for budgeting.
A) The revenues budget  
B) Net income  
C) The production budget  
D) The cash budget  
Answer: A  
Diff: 1  
Terms: operating budget  
Objective: 3  
AACSB: Reflective thinking

11) The sales forecast should be primarily based on:
A) statistical analysis.  
B) input from sales managers and sales representatives  
C) production capacity  
D) input from the board of directors  
Answer: B  
Diff: 2  
Terms: operating budget  
Objective: 3  
AACSB: Reflective thinking

12) The sales forecast is influenced by:
A) advertising and sales promotions  
B) competition  
C) general economic conditions  
D) All of these answers are correct.  
Answer: D  
Diff: 2  
Terms: operating budget  
Objective: 3  
AACSB: Reflective thinking

13) A sales forecast is:
A) often the outcome of elaborate information gathering and discussions among sales managers  
B) developed primarily to prepare next year's marketing campaign  
C) solely based on sales of the previous year  
D) a summary of product costs that influence pricing decisions  
Answer: A  
Diff: 2  
Terms: operating budget  
Objective: 3  
AACSB: Reflective thinking
14) The revenues budget identifies:
A) expected cash flows for each product
B) actual sales from last year for each product
C) the expected level of sales for the company
D) the variance of sales from actual for each product
Answer: C
Diff: 1
Terms: operating budget
Objective: 3
AACSB: Reflective thinking

15) The number of units in the sales budget and the production budget may differ because of a change in:
A) finished goods inventory levels
B) overhead charges
C) direct material inventory levels
D) sales returns and allowances
Answer: A
Diff: 3
Terms: operating budget
Objective: 3
AACSB: Reflective thinking

16) Production is primarily based on:
A) projected inventory levels
B) the revenues budget
C) the administrative costs budget
D) the capital expenditures budget
Answer: B
Diff: 2
Terms: operating budget
Objective: 3
AACSB: Reflective thinking

17) Budgeted production equals:
A) beginning finished goods inventory + budgeted unit sales - targeted ending finished goods inventory
B) targeted ending finished goods inventory + beginning finished goods inventory - budgeted unit sales
C) budgeted unit sales + targeted ending finished goods inventory - beginning finished goods inventory
D) budgeted unit sales + targeted ending finished goods inventory + beginning finished goods inventory
Answer: C
Diff: 2
Terms: operating budget
Objective: 3
AACSB: Reflective thinking
18) The direct materials usage budget is based on:
A) the units to be produced during a period
B) budgeted sales dollars
C) the predetermined factory overhead rate
D) the amount of labor-hours worked
Answer: A
Diff: 1
Terms: operating budget
Objective: 3
AACSB: Reflective thinking

19) Direct material purchases equal:
A) production needs
B) production needs plus target ending inventories
C) production needs plus beginning inventories
D) production needs plus target ending inventories less beginning inventories
Answer: D
Diff: 1
Terms: operating budget
Objective: 3
AACSB: Reflective thinking

20) Individual budgeted amounts included in the manufacturing overhead costs budget are based on input from:
A) operating personnel
B) costs incurred in prior years
C) cost changes expected in the future
D) All of these answers are correct.
Answer: D
Diff: 3
Terms: operating budget
Objective: 3
AACSB: Reflective thinking

21) The manufacturing overhead costs budget includes budgeted amounts for:
A) indirect materials
B) indirect manufacturing labor
C) depreciation on factory equipment
D) All of these answers are correct.
Answer: D
Diff: 3
Terms: operating budget
Objective: 3
AACSB: Reflective thinking
22) Budgeted manufacturing overhead costs include all types of factory expenses EXCEPT:
A) fixed items such as depreciation of manufacturing machinery
B) variable items such as plant supplies
C) indirect labor such as the salary of the plant supervisor
D) direct labor and direct materials
Answer: D
Diff: 2
Terms: operating budget
Objective: 3
AACSB: Reflective thinking

23) The cost of goods sold budget requires all of the following budgets EXCEPT:
A) direct material cost budget
B) manufacturing overhead cost budget
C) distribution cost budget
D) direct manufacturing labor cost budget
Answer: C
Diff: 2
Terms: master budget
Objective: 3
AACSB: Reflective thinking

24) Grandma's Baskets Company expects to manufacture and sell 50,000 baskets in 2011 for $5 each. There are 4,000 baskets in beginning finished goods inventory with target ending inventory of 4,000 baskets. The company keeps no work-in-process inventory. What amount of sales revenue will be reported on the 2011 budgeted income statement?
A) $246,000
B) $250,000
C) $254,000
D) $258,000
Answer: B
Explanation: B) 50,000 × $5 = $250,000
Diff: 1
Terms: operating budget
Objective: 3
AACSB: Analytical skills

25) Basile Corporation has budgeted sales of 36,000 units, target ending finished goods inventory of 6,000 units, and beginning finished goods inventory of 1,800 units. How many units should be produced next year?
A) 43,800 units
B) 40,200 units
C) 31,800 units
D) 36,000 units
Answer: B
Explanation: B) 36,000 + 6,000 - 1,800 = 40,200 units
Diff: 2
Terms: operating budget
Objective: 3
AACSB: Analytical skills
26) For next year, Manzo, Inc., has budgeted sales of 30,000 units, target ending finished goods inventory of 1,500 units, and beginning finished goods inventory of 900 units. All other inventories are zero. How many units should be produced next year?
A) 29,400 units  
B) 30,000 units  
C) 30,600 units  
D) 32,400 units  
Answer:  C  
Explanation:  C) 30,000 + 1,500 - 900 = 30,600 units  
Diff: 2  
Terms:  operating budget  
Objective:  3  
AACSB:  Analytical skills

27) Wilcox Company has budgeted sales volume of 60,000 units and budgeted production of 54,000 units, while 10,000 units are in beginning finished goods inventory. How many units are targeted for ending finished goods inventory?
A) 10,000 units  
B) 16,000 units  
C) 6,000 units  
D) 4,000 units  
Answer:  D  
Explanation:  D) 10,000 + 54,000 - 60,000 = 4,000  
Diff: 2  
Terms:  operating budget  
Objective:  3  
AACSB:  Analytical skills
Answer the following questions using the information below:

Kason, Inc., expects to sell 20,000 pool cues for $24.00 each. Direct materials costs are $4.00, direct manufacturing labor is $8.00, and manufacturing overhead is $1.60 per pool cue. The following inventory levels apply to 2011:

<table>
<thead>
<tr>
<th></th>
<th>Beginning inventory</th>
<th>Ending inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>24,000 units</td>
<td>24,000 units</td>
</tr>
<tr>
<td>Work-in-process</td>
<td>0 units</td>
<td>0 units</td>
</tr>
<tr>
<td>Finished goods</td>
<td>2,000 units</td>
<td>2,500 units</td>
</tr>
</tbody>
</table>

28) On the 2012 budgeted income statement, what amount will be reported for sales?
A) $492,000
B) $480,000
C) $624,000
D) $636,000
Answer: B
Explanation: B) 20,000 × $24 = $480,000
Diff: 2
Terms: operating budget
Objective: 3
AACSB: Analytical skills

29) How many pool cues need to be produced in 2012?
A) 22,500 cues
B) 22,000 cues
C) 20,500 cues
D) 19,500 cues
Answer: C
Explanation: C) 20,000 + 2,500 - 2,000 = 20,500 cues
Diff: 2
Terms: operating budget
Objective: 3
AACSB: Analytical skills

30) On the 2012 budgeted income statement, what amount will be reported for cost of goods sold?
A) $278,800
B) $272,000
C) $265,200
D) $306,000
Answer: B
Explanation: B) 20,000 × ($8.00 + $4.00 + $1.60) = $272,000
Diff: 3
Terms: operating budget
Objective: 3
AACSB: Analytical skills
31) What are the 2012 budgeted costs for direct materials, direct manufacturing labor, and manufacturing overhead, respectively?
   A) $0; $192,000; $38,400
   B) $78,000; $156,000; $31,200
   C) $160,000; $80,000; $32,000
   D) $82,000; $164,000; $32,800
   Answer: D
   Explanation: D) 20,500 × $4.00 = $82,000; 20,500 × $8.00 = $164,000; 20,500 × $1.60 = $32,800
   Diff: 3
   Terms: operating budget
   Objective: 3
   AACSB: Analytical skills

Answer the following questions using the information below:

Elton, Inc., expects to sell 6,000 ceramic vases for $40 each. Direct materials costs are $4, direct manufacturing labor is $20, and manufacturing overhead is $6 per vase. The following inventory levels apply to 2011:

<table>
<thead>
<tr>
<th></th>
<th>Beginning inventory</th>
<th>Ending inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>1,000 units</td>
<td>1,000 units</td>
</tr>
<tr>
<td>Work-in-process inventory</td>
<td>0 units</td>
<td>0 units</td>
</tr>
<tr>
<td>Finished goods inventory</td>
<td>400 units</td>
<td>500 units</td>
</tr>
</tbody>
</table>

32) On the 2012 budgeted income statement, what amount will be reported for sales?
   A) $244,000
   B) $236,000
   C) $280,000
   D) $240,000
   Answer: D
   Explanation: D) 6,000 × $40 = $240,000
   Diff: 2
   Terms: operating budget
   Objective: 3
   AACSB: Analytical skills

33) How many ceramic vases need to be produced in 2012?
   A) 5,900 vases
   B) 6,100 vases
   C) 7,000 vases
   D) 6,000 vases
   Answer: B
   Explanation: B) 6,000 + 500 - 400 = 6,100 vases
   Diff: 2
   Terms: operating budget
   Objective: 3
   AACSB: Analytical skills
34) On the 2012 budgeted income statement, what amount will be reported for cost of goods sold?
A) $183,000  
B) $210,000  
C) $180,000  
D) $177,000  
Answer: C  
Explanation: C) $6,000 \times ($4 + $20 + $6) = $180,000  
Diff: 3  
Terms: operating budget  
Objective: 3  
AACSB: Analytical skills

35) What are the 2012 budgeted costs for direct materials, direct manufacturing labor, and manufacturing overhead, respectively?
A) $24,400; $122,000; $36,600  
B) $24,000; $120,000; $36,000  
C) $4,000; $20,000; $6,000  
D) $4,000; $0; $9,000  
Answer: A  
Explanation: A) $6,100 \times $4 = $24,400; 6,100 \times $20 = $122,000; 6,100 \times $6 = $36,600  
Diff: 3  
Terms: operating budget  
Objective: 3  
AACSB: Analytical skills

Answer the following questions using the information below:

The following information pertains to the January operating budget for Casey Corporation, a retailer:

- Budgeted sales are $200,000 for January  
- Collections of sales are 50% in the month of sale and 50% the next month  
- Cost of goods sold averages 70% of sales  
- Merchandise purchases total $150,000 in January  
- Marketing costs are $3,000 each month  
- Distribution costs are $5,000 each month  
- Administrative costs are $10,000 each month

36) For January, budgeted gross margin is:
A) $100,000  
B) $140,000  
C) $60,000  
D) $50,000  
Answer: C  
Explanation: C) $200,000 - (.70 \times $200,000) = $60,000  
Diff: 3  
Terms: operating budget  
Objective: 3  
AACSB: Analytical skills
37) For January, the amount budgeted for the nonmanufacturing costs budget is:
A) $78,000
B) $10,000
C) $168,000
D) $18,000
Answer: D
Explanation: D) $3,000 + $5,000 + $10,000 = $18,000
Diff: 2
Terms: operating budget
Objective: 3
AACSB: Analytical skills

38) Tiger Pride produces two product lines: T-shirts and Sweatshirts. Product profitability is analyzed as follows:

<table>
<thead>
<tr>
<th></th>
<th>T-SHIRTS</th>
<th>SWEATSHIRTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production and sales volume</td>
<td>60,000 units</td>
<td>35,000 units</td>
</tr>
<tr>
<td>Selling price</td>
<td>$16.00</td>
<td>$29.00</td>
</tr>
<tr>
<td>Direct material</td>
<td>$2.00</td>
<td>$5.00</td>
</tr>
<tr>
<td>Direct labor</td>
<td>$4.50</td>
<td>$7.20</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td>$2.00</td>
<td>$3.00</td>
</tr>
<tr>
<td>Gross profit</td>
<td>$7.50</td>
<td>$13.80</td>
</tr>
<tr>
<td>Selling and administrative</td>
<td>$4.00</td>
<td>$7.00</td>
</tr>
<tr>
<td>Operating profit</td>
<td>$3.50</td>
<td>$6.80</td>
</tr>
</tbody>
</table>

What is projected operating income if direct materials costs of T-Shirts increase to $4.00 per unit and direct labor costs of Sweatshirts increase to $8.20 per unit.
A) $293,000
B) $90,000
C) $203,000
D) $473,000
Answer: A
Explanation: A) (60,000 x $1.50) + (35,000 x $5.80) = $293,000
Diff: 1
Terms: operating budget
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

Beat, Inc., expects to sell 60,000 athletic uniforms for $80 each in 2012. Direct materials costs are $20, direct manufacturing labor is $8, and manufacturing overhead is $6 for each uniform. The following inventory levels apply to 2011:

<table>
<thead>
<tr>
<th></th>
<th>Beginning inventory</th>
<th>Ending inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>24,000 units</td>
<td>18,000 units</td>
</tr>
<tr>
<td>Work-in-process inventory</td>
<td>0 units</td>
<td>0 units</td>
</tr>
<tr>
<td>Finished goods inventory</td>
<td>12,000 units</td>
<td>10,000 units</td>
</tr>
</tbody>
</table>

39) How many uniforms need to be produced in 2012?
A) 52,000 uniforms
B) 68,000 uniforms
C) 60,000 uniforms
D) 58,000 uniforms
Answer: D
Explanation: D) 60,000 + 10,000 - 12,000 = 58,000 uniforms
Diff: 2
Terms: operating budget
Objective: 3
AACSB: Analytical skills

40) What is the amount budgeted for direct material purchases in 2012?
A) $1,040,000
B) $1,200,000
C) $1,160,000
D) $1,520,000
Answer: A
Explanation: A) (60,000 +10,000 - 12,000) units + 18,000 units - 24,000 units = Purchases 52,000 units × $20 = $1,040,000
Diff: 3
Terms: operating budget
Objective: 3
AACSB: Analytical skills

41) What is the amount budgeted for cost of goods manufactured in 2012?
A) $2,040,000
B) $1,972,000
C) $2,312,000
D) $2,380,000
Answer: B
Explanation: B) (60,000 + 10,000 - 12,000) × ($20 + $8 + $6) = $1,972,000
Diff: 3
Terms: operating budget
Objective: 3
AACSB: Analytical skills
42) What is the amount budgeted for cost of goods sold in 2012?
A) $2,312,000
B) $1,972,000
C) $2,040,000
D) $4,800,000
Answer: C
Explanation: C) 60,000 × ($20 + $8 + $6) = $2,040,000
Diff: 3
Terms: operating budget
Objective: 3
AACSB: Analytical skills

Answer the following questions using the information below:

Furniture, Inc., estimates the following number of mattress sales for the first four months of 2012:

<table>
<thead>
<tr>
<th>Month</th>
<th>Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>10,000</td>
</tr>
<tr>
<td>February</td>
<td>14,000</td>
</tr>
<tr>
<td>March</td>
<td>13,000</td>
</tr>
<tr>
<td>April</td>
<td>16,000</td>
</tr>
</tbody>
</table>

Finished goods inventory at the end of December is 3,000 units. Target ending finished goods inventory is 30% of the next month's sales.

43) How many mattresses need to be produced in January 2012?
A) 8,800 mattresses
B) 11,200 mattresses
C) 13,000 mattresses
D) 14,200 mattresses
Answer: B
Explanation: B) 12,000 + (14,000 × 0.30) - 3,000 = 11,200 mattresses
Diff: 2
Terms: operating budget
Objective: 3
AACSB: Analytical skills

44) How many mattresses need to be produced in the first quarter (January, February, March) of 2012?
A) 37,000 mattresses
B) 38,800 mattresses
C) 41,800 mattresses
D) 44,800 mattresses
Answer: B
Explanation: B) 10,000 + 14,000 + 13,000 + (16,000 × 0.30) -3,000 = 38,800 mattresses
Diff: 2
Terms: operating budget
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

Wallace Company provides the following data for next year:

<table>
<thead>
<tr>
<th>Month</th>
<th>Budgeted Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>$120,000</td>
</tr>
<tr>
<td>February</td>
<td>108,000</td>
</tr>
<tr>
<td>March</td>
<td>132,000</td>
</tr>
<tr>
<td>April</td>
<td>144,000</td>
</tr>
</tbody>
</table>

The gross profit rate is 40% of sales. Inventory at the end of December is $21,600 and target ending inventory levels are 30% of next month's sales, stated at cost.

45) Purchases budgeted for January total:
A) $130,800
B) $72,000
C) $69,840
D) $74,160
Answer: C
Explanation: C) ($120,000 × 0.6) + ($108,000 × 0.6 × 0.3) - $21,600 = $69,840
Diff: 3
Terms: operating budget
Objective: 3
AACSB: Analytical skills

46) Purchases budgeted for February total:
A) $69,120
B) $60,480
C) $115,200
D) $64,800
Answer: A
Explanation: A) ($108,000 × 0.6) + ($132,000 × 0.6 × 0.3) - ($108,000 × 0.6 × 0.3) = $69,120
Diff: 3
Terms: operating budget
Objective: 3
AACSB: Analytical skills
47) Shamokin Manufacturing produces two products, Big and Bigger. Shamokin expects to sell 10,000 units of product Bigger and to have an inventory of 2,000 units of Bigger on hand at the end of the period. Currently, Shamokin has 800 units of Bigger on hand. Bigger requires two labor operations, molding and polishing. Each unit of Bigger requires one hour of molding and two hours of polishing. The direct labor rate for molding is $20 per molding hour and the direct labor rate for polishing is $25 per polishing hour. The expected cost of direct labor for Bigger is:

A) $224,000  
B) $560,000  
C) $616,000  
D) $784,000  

Answer:  D  
Explanation:  D) 10,000 + 2,000 - 800 = 11,200  
(11,200 × 1 × $20) + (11,200 × 2 × $25) = $784,000  
Diff: 3  
Terms:  operating budget  
Objective:  3  
AACSB:  Analytical skills

48) Shamokin Manufacturing produces two products, Big and Bigger. Shamokin expects to sell 10,000 units of product Bigger and to have an inventory of 2,000 units of Bigger on hand at the end of the period. Currently, Shamokin has 800 units of Bigger on hand. Bigger requires two labor operations, molding and polishing. Each unit of Bigger requires one hour of molding and two hours of polishing. The direct labor rate for molding is $20 per molding hour and the direct labor rate for polishing is $25 per polishing hour. The expected number of hours of direct labor for Bigger is:

A) 8,800 hours of molding; 17,600 hours of polishing  
B) 11,200 hours of molding; 22,400 hours of polishing  
C) 17,600 hours of molding; 8,800 hours of polishing  
D) 22,400 hours of molding; 11,200 hours of polishing  

Answer:  B  
Explanation:  B) 10,000 + 2,000 - 800 = 11,200  
(11,200 × 1) = 11,200 hours of molding; (11,200 × 2) = 22,400 hours of polishing  
Diff: 2  
Terms:  operating budget  
Objective:  3  
AACSB:  Analytical skills
49) St. Claire Manufacturing expects to produce and sell 6,000 units of Big, its only product, for $20 each. Direct material cost is $2 per unit, direct labor cost is $8 per unit, and variable manufacturing overhead is $3 per unit. Fixed manufacturing overhead is $24,000 in total. Variable selling and administrative expenses are $1 per unit, and fixed selling and administrative costs are $3,000 in total. According to generally accepted accounting principles, inventoriable cost per unit of Big would be:
A) $13.00 per unit
B) $14.00 per unit
C) $17.00 per unit
D) $18.50 per unit
Answer: C
Explanation: C) $2 + $8 +$3 +($24,000 / 6,000) = $17
Diff: 2
Terms: operating budget
Objective: 3
AACSB: Analytical skills

50) The use of activity-based budgeting is growing because of:
A) the increased use of activity-based costing
B) the increased use of kaizen costing
C) increases in work-in-process inventory
D) increases in direct materials inventory
Answer: A
Diff: 1
Terms: activity-based budgeting
Objective: 3
AACSB: Analytical skills

51) Activity-based budgeting would separately estimate:
A) the cost of overhead for a department
B) a plant-wide cost-driver rate
C) the cost of a setup activity
D) All of these answers are correct.
Answer: C
Diff: 2
Terms: activity-based budgeting
Objective: 3
AACSB: Reflective thinking

52) Activity-based-costing analysis makes no distinction between:
A) direct-materials inventory and work-in-process inventory
B) short-run variable costs and short-run fixed costs
C) parts of the supply chain
D) components of the value chain
Answer: B
Diff: 3
Terms: activity-based budgeting
Objective: 3
AACSB: Reflective thinking
53) Activity-based budgeting makes it easier to:
A) determine a rolling budget
B) prepare pro forma financial statements
C) determine how to reduce costs
D) execute a financial budget
Answer: C
Diff: 3
Terms: activity-based budgeting
Objective: 3
AACSB: Reflective thinking

54) Activity-based budgeting does NOT require:
A) knowledge of the organization's activities
B) specialized expertise in financial management and control
C) knowledge about how activities affect costs
D) the ability to see how the organization's different activities fit together
Answer: B
Diff: 3
Terms: activity-based budgeting
Objective: 3
AACSB: Reflective thinking

55) Activity-based budgeting:
A) uses one cost driver such as direct labor-hours
B) uses only output-based cost drivers such as units sold
C) focuses on activities necessary to produce and sell products and services
D) classifies costs by functional area within the value chain
Answer: C
Diff: 1
Terms: activity-based budgeting
Objective: 3
AACSB: Reflective thinking

56) Activity-based budgeting includes all the following steps EXCEPT:
A) determining demands for activities from sales and production targets
B) computing the cost of performing activities
C) determining a separate cost-driver rate for each department
D) describing the budget as costs of activities rather than costs of functions
Answer: C
Diff: 2
Terms: activity-based budgeting
Objective: 3
AACSB: Reflective thinking

57) A rolling budget is the same as a continuous budget.
Answer: TRUE
Diff: 2
Terms: rolling budget
Objective: 3
AACSB: Reflective thinking
58) The cash budget and the budgeted income statement are necessary to prepare the budgeted balance sheet and budgeted statement of cash flows.
Answer: TRUE
Diff: 2
Terms: master budget
Objective: 3
AACSB: Reflective thinking

59) Preparation of the budgeted statement of cash flows is the final step in preparing the operating budget.
Answer: FALSE
Explanation: Preparation of the budgeted income statement is the final step in preparing the operating budget.
Diff: 1
Terms: operating budget
Objective: 3
AACSB: Reflective thinking

60) The sales forecast should primarily be based on statistical analysis with secondary input from sales managers and sales representatives.
Answer: FALSE
Explanation: The sales forecast should be primarily based on input from sales managers and sales representatives with secondary input from statistical analysis.
Diff: 3
Terms: operating budget
Objective: 3
AACSB: Reflective thinking

61) The usual starting point in budgeting is to forecast net income.
Answer: FALSE
Explanation: The usual starting point in budgeting is to forecast sales demand and revenues.
Diff: 2
Terms: operating budget
Objective: 3
AACSB: Reflective thinking

62) The revenues budget should be based on the production budget.
Answer: FALSE
Explanation: The production budget should be based on the revenues budget.
Diff: 1
Terms: operating budget
Objective: 3
AACSB: Reflective thinking
63) The financial budget is that part of the master budget that includes the capital expenditures budget, cash budget, budgeted balance sheet, and the budgeted statement of cash flows.
Answer: TRUE  
Diff: 1  
Terms: operating budget  
Objective: 3  
AACSB: Reflective thinking

64) Since fixed manufacturing overhead is fixed, it is NOT normally included in the operating budget.
Answer: FALSE  
Explanation: Fixed manufacturing is normally included in the operating budget.  
Diff: 2  
Terms: operating budget  
Objective: 3  
AACSB: Reflective thinking

65) The manufacturing labor budget depends on wage rates, production methods, and hiring plans.
Answer: TRUE  
Diff: 2  
Terms: operating budget  
Objective: 3  
AACSB: Reflective thinking

66) The manufacturing labor budget depends on wage rates, production methods, and hiring plans.
Answer: TRUE  
Diff: 2  
Terms: operating budget  
Objective: 3  
AACSB: Reflective thinking

67) If inventoriable costs in the operating budget are going to be in accordance with Generally Accepted Accounting Principles (GAAP), they include only variable manufacturing costs.
Answer: FALSE  
Explanation: If inventoriable costs in the operating budget are going to be in accordance with Generally Accepted Accounting Principles (GAAP), they include variable and fixed manufacturing costs.  
Diff: 3  
Terms: operating budget  
Objective: 3  
AACSB: Reflective thinking

68) Activity-based budgeting provides better decision-making information than budgeting based solely on output-based cost drivers (units produced, units sold, or revenues).
Answer: TRUE  
Diff: 2  
Terms: activity-based budgeting  
Objective: 3  
AACSB: Communication
69) Activity-based costing analysis takes a long-run perspective and treats all activity costs as variable costs.
Answer: TRUE
Diff: 3
Terms: activity-based budgeting
Objective: 3
AACSB: Reflective thinking

70) Activity-based budgeting (ABB) focuses on the budgeting cost of activities necessary to produce and sell products and services.
Answer: TRUE
Diff: 1
Terms: activity-based budgeting
Objective: 3
AACSB: Reflective thinking

71) Activity-based budgeting would permit the use of multiple drivers and multiple cost pools in the budgeting process.
Answer: TRUE
Diff: 2
Terms: activity-based budgeting
Objective: 3
AACSB: Reflective thinking

72) Listed below are elements of the master budget. Determine whether each budget is an operating budget or a financial budget. Place an O for operating budget or F for a financial budget.

1. Capital expenditures budget
2. Cost of goods sold budget
3. Revenues budget
4. Budgeted statement of cash flows
5. Distribution costs budget
6. Marketing costs budget
7. Cash budget
8. Direct materials cost budget
9. Budgeted balance sheet
10. Budgeted income statement

Answer:
1. F
2. O
3. O
4. F
5. O
6. O
7. F
8. O
9. F
10. O

Diff: 3
Terms: master budget
Objective: 3
AACSB: Analytical skills
73) Nittany Company sells three products with the following seasonal sales pattern:

<table>
<thead>
<tr>
<th>Quarter</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40%</td>
<td>30%</td>
<td>10%</td>
</tr>
<tr>
<td>2</td>
<td>30%</td>
<td>20%</td>
<td>40%</td>
</tr>
<tr>
<td>3</td>
<td>20%</td>
<td>20%</td>
<td>40%</td>
</tr>
<tr>
<td>4</td>
<td>10%</td>
<td>30%</td>
<td>10%</td>
</tr>
</tbody>
</table>

The annual sales budget shows forecasts for the different products and their expected selling price per unit as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>Units</th>
<th>Selling Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>50,000</td>
<td>$8</td>
</tr>
<tr>
<td>B</td>
<td>125,000</td>
<td>20</td>
</tr>
<tr>
<td>C</td>
<td>62,500</td>
<td>12</td>
</tr>
</tbody>
</table>

**Required:**
Prepare a sales budget, in units and dollars, by quarters for the company for the coming year.

**Answer:**

<table>
<thead>
<tr>
<th>Product</th>
<th>First Quarter</th>
<th>Second Quarter</th>
<th>Third Quarter</th>
<th>Fourth Quarter</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Sales (units)</td>
<td>20,000</td>
<td>15,000</td>
<td>10,000</td>
<td>5,000</td>
</tr>
<tr>
<td></td>
<td>Price × $8</td>
<td>× $8</td>
<td>× $8</td>
<td>× $8</td>
<td>× $8</td>
</tr>
<tr>
<td></td>
<td>Sales</td>
<td>$160,000</td>
<td>$120,000</td>
<td>$80,000</td>
<td>$40,000</td>
</tr>
<tr>
<td>B</td>
<td>Sales (units)</td>
<td>37,500</td>
<td>25,000</td>
<td>25,000</td>
<td>37,500</td>
</tr>
<tr>
<td></td>
<td>Price × $20</td>
<td>× $20</td>
<td>× $20</td>
<td>× $20</td>
<td>× $20</td>
</tr>
<tr>
<td></td>
<td>Sales</td>
<td>$750,000</td>
<td>$500,000</td>
<td>$500,000</td>
<td>$750,000</td>
</tr>
<tr>
<td>C</td>
<td>Sales (units)</td>
<td>6,250</td>
<td>25,000</td>
<td>25,000</td>
<td>6,250</td>
</tr>
<tr>
<td></td>
<td>Price × $12</td>
<td>× $12</td>
<td>× $12</td>
<td>× $12</td>
<td>× $12</td>
</tr>
<tr>
<td></td>
<td>Sales</td>
<td>$75,000</td>
<td>$300,000</td>
<td>$300,000</td>
<td>$75,000</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>$985,000</td>
<td>$920,000</td>
<td>$880,000</td>
<td>$865,000</td>
</tr>
</tbody>
</table>

Diff: 2
Terms: operating budget
Objective: 3
AACSB: Analytical skills
74) Lubriderm Corporation has the following budgeted sales for the next six-month period:

<table>
<thead>
<tr>
<th>Month</th>
<th>Unit Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>90,000</td>
</tr>
<tr>
<td>July</td>
<td>120,000</td>
</tr>
<tr>
<td>August</td>
<td>210,000</td>
</tr>
<tr>
<td>September</td>
<td>150,000</td>
</tr>
<tr>
<td>October</td>
<td>180,000</td>
</tr>
<tr>
<td>November</td>
<td>120,000</td>
</tr>
</tbody>
</table>

There were 30,000 units of finished goods in inventory at the beginning of June. Plans are to have an inventory of finished products that equal 20% of the unit sales for the next month.

Five pounds of materials are required for each unit produced. Each pound of material costs $8. Inventory levels for materials are equal to 30% of the needs for the next month. Materials inventory on June 1 was 15,000 pounds.

**Required:**

a. Prepare production budgets in units for July, August, and September.

b. Prepare a purchases budget in pounds for July, August, and September, and give total purchases in both pounds and dollars for each month.

**Answer:**

a. | July | August | September |
---|------|--------|-----------|
Budgeted sales | 120,000 | 210,000 | 150,000 |
Add: Required ending inventory | 42,000 | 30,000 | 36,000 |
Total inventory requirements | 162,000 | 240,000 | 186,000 |
Less: Beginning inventory | 24,000 | 42,000 | 30,000 |
Budgeted production | 138,000 | 198,000 | 156,000 |

b. | July | August | September |
---|------|--------|-----------|
Production in units | 138,000 | 198,000 | 156,000 |
Targeted ending inventory in lbs.* | 297,000 | 234,000 | **252,000** |
Production needs in lbs.*** | 690,000 | 990,000 | 780,000 |
Total requirements in lbs. | 987,000 | 1,224,000 | 1,032,000 |
Less: Beginning inventory in lbs.**** | **207,000** | 297,000 | 234,000 |
Purchases needed in lbs. | 780,000 | 927,000 | 798,000 |
Cost ($8 per lb.) | × $8 | × $8 | × $8 |
Total material purchases | **$6,240,000** | **$7,416,000** | **$6,384,000** |
75) Perry Company has the following information:

<table>
<thead>
<tr>
<th>Month</th>
<th>Budgeted Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>March</td>
<td>$100,000</td>
</tr>
<tr>
<td>April</td>
<td>106,000</td>
</tr>
<tr>
<td>May</td>
<td>102,000</td>
</tr>
<tr>
<td>June</td>
<td>109,000</td>
</tr>
<tr>
<td>July</td>
<td>105,000</td>
</tr>
</tbody>
</table>

In addition, the gross profit rate is 40% and the desired inventory level is 30% of next month's cost of sales.

**Required:**
Prepare a purchases budget for April through June.

<table>
<thead>
<tr>
<th>Answer:</th>
<th>April</th>
<th>May</th>
<th>June</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desired ending inventory</td>
<td>$18,360</td>
<td>$19,620</td>
<td>$18,900</td>
<td>$18,900</td>
</tr>
<tr>
<td>Plus COGS</td>
<td>63,600</td>
<td>61,200</td>
<td>65,400</td>
<td>190,200</td>
</tr>
<tr>
<td>Total needed</td>
<td>81,960</td>
<td>80,820</td>
<td>84,300</td>
<td>209,100</td>
</tr>
<tr>
<td>Less beginning inventory</td>
<td>19,080</td>
<td>18,360</td>
<td>19,620</td>
<td>19,080</td>
</tr>
<tr>
<td>Total purchases</td>
<td>$62,880</td>
<td>$62,460</td>
<td>$64,680</td>
<td>$190,020</td>
</tr>
</tbody>
</table>

Diff: 2

Terms: operating budget
Objective: 3
AACSB: Analytical skills
76) Favata Company has the following information:

<table>
<thead>
<tr>
<th>Month</th>
<th>Budgeted Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>June</td>
<td>$60,000</td>
</tr>
<tr>
<td>July</td>
<td>51,000</td>
</tr>
<tr>
<td>August</td>
<td>40,000</td>
</tr>
<tr>
<td>September</td>
<td>70,000</td>
</tr>
<tr>
<td>October</td>
<td>72,000</td>
</tr>
</tbody>
</table>

In addition, the cost of goods sold rate is 70% and the desired inventory level is 30% of next month's cost of sales.

**Required:**
Prepare a purchases budget for July through September.

**Answer:**

<table>
<thead>
<tr>
<th></th>
<th>July</th>
<th>Aug</th>
<th>Sept</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desired ending inventory</td>
<td>$8,400</td>
<td>$14,700</td>
<td>$15,120</td>
<td>$15,120</td>
</tr>
<tr>
<td>Plus COGS</td>
<td>35,700</td>
<td>28,000</td>
<td>49,000</td>
<td>112,700</td>
</tr>
<tr>
<td>Total needed</td>
<td>44,100</td>
<td>42,700</td>
<td>64,120</td>
<td>127,820</td>
</tr>
<tr>
<td>Less beginning inventory</td>
<td>10,710</td>
<td>8,400</td>
<td>14,700</td>
<td>10,710</td>
</tr>
<tr>
<td>Total purchases</td>
<td>$33,390</td>
<td>$34,300</td>
<td>$49,420</td>
<td>$117,110</td>
</tr>
</tbody>
</table>

**Terms:** operating budget  
**Objective:** 3  
**AACSB:** Analytical skills

77) Picture Pretty manufactures picture frames. Sales for August are expected to be 10,000 units of various sizes. Historically, the average frame requires four feet of framing, one square foot of glass, and two square feet of backing. Beginning inventory includes 1,500 feet of framing, 500 square feet of glass, and 500 square feet of backing. Current prices are $0.30 per foot of framing, $6.00 per square foot of glass, and $2.25 per square foot of backing. Ending inventory should be 150% of beginning inventory. Purchases are paid for in the month acquired.

**Required:**

a. Determine the quantity of framing, glass, and backing that is to be purchased during August.

b. Determine the total costs of direct materials for August purchases.
Answer:

a.  

<table>
<thead>
<tr>
<th></th>
<th>Framing</th>
<th>Glass</th>
<th>Backing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Desired ending inventory*</td>
<td>2,250</td>
<td>750</td>
<td>750</td>
</tr>
<tr>
<td>Production needs (10,000 units)**</td>
<td>40,000</td>
<td>10,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Total needs</td>
<td>42,250</td>
<td>10,750</td>
<td>20,750</td>
</tr>
<tr>
<td>Less: Beginning inventory</td>
<td>1,500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Purchases planned</td>
<td>40,750</td>
<td>10,250</td>
<td>20,250</td>
</tr>
</tbody>
</table>

b. Cost of direct materials:

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Framing (40,750 × $0.30)</td>
<td>$12,225.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glass (10,250 × $6.00)</td>
<td>61,500.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backing (20,250 × $2.25)</td>
<td>45,562.50</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$119,287.50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* 1,500 × 1.5 = 2,250 framing  
500 × 1.5 = 750 glass  
500 × 1.5 = 750 backing  

**10,000 × 4 = 40,000 framing  
10,000 × 1 = 10,000 glass  
10,000 × 2 = 20,000 backing  

Diff: 2  
Terms: operating budget  
Objective: 3  
AACSB: Analytical skills
78) Christy Enterprises reports the year-end information from 2011 as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (100,000 units)</td>
<td>$500,000</td>
</tr>
<tr>
<td>Less: Cost of goods sold</td>
<td>300,000</td>
</tr>
<tr>
<td>Gross profit</td>
<td>200,000</td>
</tr>
<tr>
<td>Operating expenses (includes $20,000 of Depreciation)</td>
<td>120,000</td>
</tr>
<tr>
<td>Net income</td>
<td>$ 80,000</td>
</tr>
</tbody>
</table>

Christy is developing the 2012 budget. In 2012 the company would like to increase selling prices by 10%, and as a result expects a decrease in sales volume of 5%. Cost of goods sold as a percentage of sales is expected to increase to 62%. Other than depreciation, all operating costs are variable.

**Required:**
Prepare a budgeted income statement for 2012.

**Answer:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (95,000 × $5.50)</td>
<td>$522,500</td>
</tr>
<tr>
<td>Cost of goods sold (2012 sales × 62%)</td>
<td>323,950</td>
</tr>
<tr>
<td>Gross profit</td>
<td>198,550</td>
</tr>
<tr>
<td>Less: Operating expenses [(1.00 × 95,000] + $20,000)</td>
<td>115,000</td>
</tr>
<tr>
<td>Net income</td>
<td>$ 83,550</td>
</tr>
</tbody>
</table>

**Diff:** 2

Terms: operating budget
Objective: 3
AACSB: Analytical skills
79) Shamokin Manufacturing produces two products, Big and Bigger. Shamokin expects to sell 20,000 units of Big and 10,000 units of Bigger. Shamokin plans on having an ending inventory of 4,000 units of Big and 2,000 units of Bigger. Currently, Shamokin has 1,000 units of Big in its inventory and 800 units of Bigger. Each product requires two labor operations: molding and polishing. Product Big requires one hour of molding time and one hour of polishing time. Product Bigger requires one hour of molding time and two hours of polishing time. The direct labor rate for molders is $20 per molding hour, and the direct labor rate for polishers is $25 per polishing hour.

**Required:**
Prepare a direct labor budget in hours and dollars for each product.

**Answer:**

<table>
<thead>
<tr>
<th></th>
<th>Big</th>
<th>Bigger</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Expected sales</strong></td>
<td>20,000</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td><strong>Desired ending inventory</strong></td>
<td>4,000</td>
<td>2,000</td>
<td></td>
</tr>
<tr>
<td><strong>Production needs</strong></td>
<td>24,000</td>
<td>12,000</td>
<td></td>
</tr>
<tr>
<td><strong>Less: beginning inventory</strong></td>
<td>1,000</td>
<td>800</td>
<td></td>
</tr>
<tr>
<td><strong>Desired production</strong></td>
<td>23,000</td>
<td>11,200</td>
<td></td>
</tr>
</tbody>
</table>

**Direct Labor Budget for Big:**

<table>
<thead>
<tr>
<th></th>
<th>Molding</th>
<th>Polishing</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Desired Production of Big</strong></td>
<td>23,000</td>
<td>23,000</td>
<td></td>
</tr>
<tr>
<td><strong>Hours of Labor Required per unit</strong></td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td><strong>Total Hours of Labor Required</strong></td>
<td>23,000</td>
<td>23,000</td>
<td></td>
</tr>
<tr>
<td><strong>Direct Labor Rate</strong></td>
<td>$20</td>
<td>$25</td>
<td></td>
</tr>
<tr>
<td><strong>Cost of Direct Labor for Big</strong></td>
<td>$460,000</td>
<td>$575,000</td>
<td>$1,035,000</td>
</tr>
</tbody>
</table>

**Direct Labor Budget for Bigger:**

<table>
<thead>
<tr>
<th></th>
<th>Molding</th>
<th>Polishing</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Desired Production of Bigger</strong></td>
<td>11,200</td>
<td>11,200</td>
<td></td>
</tr>
<tr>
<td><strong>Hours of Labor Required per unit</strong></td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td><strong>Total Hours of Labor Required</strong></td>
<td>11,200</td>
<td>22,400</td>
<td></td>
</tr>
<tr>
<td><strong>Direct Labor Rate</strong></td>
<td>$20</td>
<td>$25</td>
<td></td>
</tr>
<tr>
<td><strong>Cost of Direct Labor for Bigger</strong></td>
<td>$224,000</td>
<td>$560,000</td>
<td>$784,000</td>
</tr>
</tbody>
</table>

**Total Direct Labor Costs**

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct Labor Costs</strong></td>
<td>$684,000</td>
<td>$1,135,000</td>
<td>$1,819,000</td>
</tr>
</tbody>
</table>

Diff: 2
Terms: operating budget
Objective: 3
AACSB: Analytical skills
80) Describe operating and financial budgets and give at least two examples of each discussed in the textbook.
Answer: Operating budgets specify the expected outcomes of any selling, manufacturing, purchasing, labor management, R&D, marketing, distribution, customer service, and administrative activities during the planning period. Operations personnel use these plans to guide and coordinate activities during the planning period.

Examples of operating budgets include the revenues budget, production budget, direct materials costs budget, direct manufacturing labor costs budget, manufacturing overhead budget, and budgets for R&D, marketing, distribution, customer service, and administrative activities.

Financial budgets are used to evaluate the financial consequences of a proposed decision.

Examples of financial budgets include the capital expenditures budget, cash budget, budgeted balance sheet, and the budgeted statement of cash flows.
Diff: 2
Terms: operating budget, financial budget
Objective: 3
AACSB: Reflective thinking

81) Discuss the importance of the sales forecast and items that influence its accuracy.
Answer: All other budgets are based on information from the sales forecast.

The sales forecast is a challenge to predict because its accuracy depends on the ability to forecast the state of the general economy, changes in the industry, actions of the competition, and developments in technology. Each of these items affects individual products or product lines and are quantified and aggregated to obtain the sales forecast.
Diff: 2
Terms: operating budget
Objective: 3
AACSB: Reflective thinking

Objective 6.4

1) Financial planning models:
A) are not used in the budgeting process
B) are not useful for sensitivity analysis
C) are mathematical representations of the relationships affecting the budget process
D) are used for nonfinancial aspects of budgeting
Answer: C
Diff: 2
Terms: financial planning models
Objective: 4
AACSB: Reflective thinking
2) Financial planning software packages assist management with:
A) assigning responsibility to various levels of management
B) identifying the target customer
C) sensitivity analysis in their planning and budgeting activities
D) achieving greater commitment from lower management
Answer: C
Diff: 2
Terms: financial planning models
Objective: 4
AACSB: Use of Information Technology

3) _______ uses a "what-if" technique that examines how results will change if the originally predicted data changes.
A) A sales forecast
B) A sensitivity analysis
C) A pro forma financial statement
D) The statement of cash flows
Answer: B
Diff: 1
Terms: sensitivity analysis
Objective: 4
AACSB: Reflective thinking

4) When performing a sensitivity analysis, if the selling price per unit is increased, then the:
A) per unit fixed administrative costs will increase
B) per unit direct materials purchase price will increase
C) total volume of sales will increase
D) total costs for sales commissions and other nonmanufacturing variable costs will increase
Answer: D
Diff: 3
Terms: sensitivity analysis
Objective: 4
AACSB: Reflective thinking

5) Sensitivity analysis is useful for examining all of the following EXCEPT:
A) changes in employee satisfaction
B) changes in direct material cost
C) changes in sales price
D) changes in direct labor cost
Answer: A
Diff: 3
Terms: sensitivity analysis
Objective: 4
AACSB: Reflective thinking
Answer the following questions using the information below:

Kramer Enterprises reports year-end information from 2010 as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (160,000 units)</td>
<td>$960,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>$640,000</td>
</tr>
<tr>
<td>Gross margin</td>
<td>$320,000</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>$260,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$ 60,000</td>
</tr>
</tbody>
</table>

Kramer is developing the 2011 budget. In 2011 the company would like to increase selling prices by 8%, and as a result expects a decrease in sales volume of 10%. All other operating expenses are expected to remain constant. Assume that COGS is a variable cost and that operating expenses are a fixed cost.

6) What is budgeted sales for 2011?
   A) $1,036,800
   B) $1,066,666
   C) $933,120
   D) $864,000
   Answer:  C
   Explanation:  C) $960,000 × 1.08 × 0.90 = $933,120
   Diff: 3
   Terms:  sensitivity analysis
   Objective:  4
   AACSB:  Analytical skills

7) What is budgeted cost of goods sold for 2011?
   A) $622,080
   B) $576,000
   C) $691,200
   D) $640,000
   Answer:  B
   Explanation:  B) $640,000 × 0.90 = $576,000
   Diff: 3
   Terms:  sensitivity analysis
   Objective:  4
   AACSB:  Analytical skills
8) Should Kramer increase the selling price in 2011?
A) Yes, because operating income is increased for 2011.
B) Yes, because sales revenue is increased for 2011.
C) No, because sales volume decreases for 2011.
D) No, because gross margin decreases for 2011.
Answer: A
Explanation: A) $933,120 - $576,000 - 260,000 = $97,120; Yes, because it would result in an increase in operating income compared to 2010.
Diff: 3
Terms: sensitivity analysis
Objective: 4
AACSB: Analytical skills

Answer the following questions using the information below:

Brent Enterprises reports the year-end information from 2011 as follows:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (35,000 units)</td>
<td>$280,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>105,000</td>
</tr>
<tr>
<td>Gross margin</td>
<td>175,000</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>100,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>75,000</td>
</tr>
</tbody>
</table>

Brent is developing the 2012 budget. In 2012 the company would like to increase selling prices by 4%, and as a result expects a decrease in sales volume of 10%. All other operating expenses are expected to remain constant. Assume that COGS is a variable cost and that operating expenses are a fixed cost.

9) What is budgeted sales for 2012?
A) $291,200
B) $262,080
C) $252,000
D) $280,000
Answer: B
Explanation: B) $280,000 × 1.04 × 0.90 = $262,080
Diff: 3
Terms: sensitivity analysis
Objective: 4
AACSB: Analytical skills
10) What is budgeted cost of goods sold for 2012?
A) $94,500
B) $98,280
C) $109,200
D) $105,000
Answer: A
Explanation: A) $105,000 × 0.90 = $94,500
Diff: 3
Terms: sensitivity analysis
Objective: 4
AACSB: Analytical skills

11) Should Brent increase the selling price in 2012?
A) Yes, because sales revenue is increased for 2012.
B) Yes, because operating income is increased for 2012.
C) No, because sales volume decreases for 2012.
D) No, because gross margin decreases for 2012.
Answer: D
Explanation: D) $262,080 - $94,500 = $167,580 gross margin - $100,000 = $67,580 operating income.
No, because there would be a decrease in gross margin and operating income compared to 2011.
Diff: 3
Terms: sensitivity analysis
Objective: 4
AACSB: Reflective thinking

12) If budgeted amounts change, sensitivity analysis can be used to examine changes in the budgeted results.
Answer: TRUE
Diff: 2
Terms: sensitivity analysis
Objective: 4
AACSB: Reflective thinking

13) Computer-based financial planning models are mathematical statements of the interrelationships among operating activities, financial activities, and other factors that affect the budget.
Answer: TRUE
Diff: 1
Terms: financial planning models
Objective: 4
AACSB: Use of Information Technology

14) Most computer-based financial planning models have difficulty incorporating sensitivity (what-if) analysis.
Answer: FALSE
Explanation: Computer-based financial planning models easily assist management with sensitivity (what-if) analysis.
Diff: 2
Terms: financial planning models, sensitivity analysis
Objective: 4
AACSB: Use of Information Technology
15) Sensitivity analysis is a "what-if" technique that examines how a result will change if the original prediction or assumptions change.
Answer: TRUE
Diff: 2
Terms: sensitivity analysis
Objective: 4
AACSB: Reflective thinking

16) If we increase the selling price of our product, we should probably expect an increase in the number of these products sold.
Answer: FALSE
Explanation: If we increase the selling price of our product, we should probably expect a decrease in the number of these products sold.
Diff: 2
Terms: sensitivity analysis
Objective: 4
AACSB: Analytical skills

17) If we decrease the selling price of our product, we can always expect a decrease in total revenue.
Answer: FALSE
Explanation: If we decrease the selling price of our product, we may experience either an increase in total revenue or a decrease in total revenue due to the uncertain effect of the price decrease on the quantity demanded.
Diff: 2
Terms: sensitivity analysis
Objective: 4
AACSB: Analytical skills

18) Explain what is meant by sensitivity analysis in budgeting, and discuss how managers might use sensitivity analysis in practice.
Answer: Sensitivity analysis is a "what-if" technique that examines how results will change if the original predicted data are not achieved or if an underlying assumption changes. Managers often use financial planning models, which are mathematical representations of relationships among the factors that influence the master budget.

It is possible, using these models, to examine the financial impact of one or more parameters that influence a master budget, for example selling price and material cost. Management could consider three levels of each of these two parameters, resulting in nine scenarios of different selling prices and material costs. The financial model could then present a master budget based on each of these changes, and demonstrate the financial impact on the original data given changes in selling prices and/or material costs. Management could use these predictions to make contingency plans, change their strategies, or simply update the budgets as environmental conditions change.
Diff: 2
Terms: sensitivity analysis
Objective: 4
AACSB: Reflective thinking
Objective 6.5

1) Responsibility accounting:
   A) is a system that measures the plans, budgets, actions, and actual results of a responsibility center
   B) is an arrangement of lines of responsibility within the organization
   C) explicitly incorporates continuous improvement anticipated during the budget period
   D) examines how a result will change if the original plan is not achieved
   Answer: A
   Diff: 2
   Terms: responsibility accounting
   Objective: 5
   AACSB: Reflective thinking

2) Responsibility centers include all of the following EXCEPT:
   A) cost
   B) revenue
   C) customers
   D) investment
   Answer: C
   Diff: 2
   Terms: responsibility center
   Objective: 5
   AACSB: Reflective thinking

3) Variances between actual and budgeted amounts can be used to:
   A) alert managers to potential problems and available opportunities
   B) inform managers about how well the company has implemented its strategies
   C) signal that company strategies are ineffective
   D) All of these answers are correct.
   Answer: D
   Diff: 2
   Terms: responsibility accounting
   Objective: 5
   AACSB: Reflective thinking

4) A maintenance manager is most likely responsible for a(n):
   A) revenue center
   B) investment center
   C) cost center
   D) profit center
   Answer: C
   Diff: 1
   Terms: cost center
   Objective: 5
   AACSB: Reflective thinking
5) The regional sales office manager of a national firm is most likely responsible for a(n):
A) revenue center
B) investment center
C) cost center
D) profit center
Answer: A
Diff: 1
Terms: revenue center
Objective: 5
AACSB: Multiculturalism and diversity

6) A regional manager of a restaurant chain in charge of finding additional locations for expansion is most likely responsible for a(n):
A) revenue center
B) investment center
C) cost center
D) profit center
Answer: B
Diff: 1
Terms: investment center
Objective: 5
AACSB: Analytical skills

7) The manager of a hobby store that is part of a chain of stores is most likely responsible for a(n):
A) revenue center
B) investment center
C) cost center
D) profit center
Answer: D
Diff: 1
Terms: profit center
Objective: 5
AACSB: Analytical skills

8) A manager of a revenue center is responsible for all of the following EXCEPT:
A) service quality and units sold
B) the acquisition cost of the product or service sold
C) price, product mix, and promotional activities
D) investments of excess cash
Answer: B
Diff: 2
Terms: revenue center
Objective: 5
AACSB: Reflective thinking
9) A manager of a profit center is responsible for all of the following EXCEPT:
A) sales revenue
B) the cost of merchandise purchased for resale
C) expanding into new geographic areas
D) selling and marketing costs
Answer: C
Diff: 2
Terms: profit center
Objective: 5
AACSB: Reflective thinking

10) A controllable cost is any cost that can be ________ by a responsibility center manager for a period of time.
A) controlled
B) influenced
C) segregated
D) excluded
Answer: B
Diff: 2
Terms: controllable cost
Objective: 5
AACSB: Reflective thinking

11) A responsibility accounting system could:
A) exclude all uncontrollable costs
B) exclude controllable costs
C) segregate uncontrollable costs from controllable costs
D) Both A and C are correct.
Answer: D
Diff: 2
Terms: responsibility accounting
Objective: 5
AACSB: Analytical skills

12) Which statement about controllability is NOT true:
A) few costs are clearly under the sole influence of one manager
B) holds managers responsible for uncontrollable costs
C) with a long enough time span, all costs will come under somebody's control
D) describes the degree of influence that managers have over a particular item
Answer: B
Diff: 2
Terms: controllable cost
Objective: 5
AACSB: Reflective thinking
13) Controllability may be difficult to pinpoint because of all the following EXCEPT:
A) some costs depend on market conditions
B) current managers may have inherited inefficiencies of a previous manager
C) the current use of stretch or challenge targets
D) few costs are under the sole influence of one manager
Answer: C
Diff: 2
Terms: controllable cost
Objective: 5
AACSB: Analytical skills

14) Responsibility accounting:
A) emphasizes controllability
B) focuses on whom should be asked about the information
C) attempts to assign blame for problems to a specific manager
D) All of these answers are correct.
Answer: B
Diff: 3
Terms: responsibility accounting
Objective: 5
AACSB: Reflective thinking

15) A primary consideration in assigning a cost to a responsibility center is:
A) whether the cost is fixed or variable
B) whether the cost is direct or indirect
C) who can best control the change in that cost
D) where in the organizational structure the cost was incurred
Answer: C
Diff: 3
Terms: responsibility center
Objective: 5
AACSB: Reflective thinking

16) A responsibility center is a part, segment, or subunit of an organization, whose manager is accountable for a specified set of activities.
Answer: TRUE
Diff: 1
Terms: responsibility center
Objective: 5
AACSB: Reflective thinking

17) Each manager, regardless of level, is in charge of a responsibility center.
Answer: TRUE
Diff: 2
Terms: responsibility center
Objective: 5
AACSB: Reflective thinking
18) In a cost center, a manager is responsible for investments, revenues, and costs.
Answer: FALSE
Explanation: In a cost center, a manager is responsible for costs, but not revenues or investments.
Diff: 1
Terms: cost center
Objective: 5
AACSB: Reflective thinking

19) A packaging department is most likely a profit center.
Answer: FALSE
Explanation: A packaging department is most likely a cost center.
Diff: 2
Terms: profit center
Objective: 5
AACSB: Analytical skills

20) Variances between actual and budgeted amounts inform management about performance relative to the budget.
Answer: TRUE
Diff: 1
Terms: responsibility accounting
Objective: 5
AACSB: Communication

21) An organization structure is an arrangement of lines of responsibility within the entity.
Answer: TRUE
Diff: 1
Terms: organization structure
Objective: 5
AACSB: Communication

22) A responsibility center can be structured to promote better alignment of individual and company goals.
Answer: TRUE
Diff: 2
Terms: responsibility center
Objective: 5
AACSB: Communication

23) Management will most likely behave the same way if a department is structured as a cost center or if the same department is structured as a profit center.
Answer: FALSE
Explanation: Management will most likely behave differently if a department is structured as a cost center than if the same department is structured as a profit center due to the incentives to control costs as well as revenues in a profit center.
Diff: 2
Terms: revenue center, profit center
Objective: 5
AACSB: Reflective thinking
24) Responsibility accounting focuses on control, NOT on information and knowledge.
Answer: FALSE
Explanation: Responsibility accounting focuses on information and knowledge, not on control.
Diff: 2
Terms: responsibility accounting
Objective: 5
AACSB: Communication

25) The fundamental purpose of responsibility accounting is to fix blame when budgets are NOT achieved.
Answer: FALSE
Explanation: The fundamental purpose of responsibility accounting is to gather information when budgets are not achieved.
Diff: 2
Terms: responsibility accounting
Objective: 5
AACSB: Communication

26) Distinguish between controllable and uncontrollable aspects of revenue and costs. Can a manager totally control all revenue and costs? Why or why not?
Answer: Although no revenue or cost can be totally controlled, a cost or revenue is a controllable item when a manager has significant influence over the amount of a cost or revenue. It is uncontrollable if this is not the case. A manager's ability to influence costs and revenues depends on two factors: (1) the manager's level of authority, and (2) the time period involved. Costs and revenue contracts, the economic costs of disposing of fixed assets, and the economy are three conditions that are likely to affect the period of time during which an item is not controllable.
Diff: 2
Terms: controllable cost
Objective: 5
AACSB: Reflective thinking
Objective 6.6

1) The Japanese use the term kaizen when referring to:
   A) scarce resources
   B) pro forma financial statements
   C) continuous improvement
   D) the sales forecast
   Answer: C
   Diff: 1
   Terms: kaizen budgeting
   Objective: 6
   AACSB: Multiculturalism and diversity

2) Kaizen refers to incorporating cost reductions:
   A) in each successive budgeting period
   B) in each successive sales forecast
   C) in all customer service centers
   D) All of these answers are correct.
   Answer: A
   Diff: 2
   Terms: kaizen budgeting
   Objective: 6
   AACSB: Multiculturalism and diversity

3) All of the following are encouraged with kaizen budgeting EXCEPT:
   A) better interactions with suppliers
   B) large discontinuous improvements
   C) cost reductions during manufacturing
   D) systematic monthly cost reductions
   Answer: B
   Diff: 3
   Terms: kaizen budgeting
   Objective: 6
   AACSB: Multiculturalism and diversity

4) Kaizen budgeting involves:
   A) large cost reductions
   B) management directed improvements
   C) continual small cost reductions
   D) continual small revenue increases
   Answer: C
   Diff: 3
   Terms: kaizen budgeting
   Objective: 6
   AACSB: Multiculturalism and diversity
5) Kaizen budgeting is driven by:
A) management
B) employees
C) stockholders
D) creditors
Answer: B
Diff: 3
Terms: kaizen budgeting
Objective: 6
AACSB: Multiculturalism and diversity

Answer the following questions using the information below:

Sherry and John Enterprises are using the kaizen approach to budgeting for 2011. The budgeted income statement for January 2011 is as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (168,000 units)</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Less: Cost of goods sold</td>
<td>600,000</td>
</tr>
<tr>
<td>Gross margin</td>
<td>400,000</td>
</tr>
<tr>
<td>Operating expenses (includes $50,000 of fixed costs)</td>
<td>300,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$ 100,000</td>
</tr>
</tbody>
</table>

Under the kaizen approach, cost of goods sold and variable operating expenses are budgeted to decline by 1% per month.

6) What is budgeted cost of goods sold for March 2011?
A) $588,060
B) $592,000
C) $600,000
D) $594,000
Answer: A
Explanation: A) $600,000 × 0.99 × 0.99 = $588,060
Diff: 3
Terms: kaizen budgeting
Objective: 6
AACSB: Analytical skills

7) What is budgeted gross margin for March 2011?
A) $392,040
B) $396,000
C) $408,040
D) $411,940
Answer: D
Explanation: D) $1,000,000 - ($600,000 × .99 × .99) = $411,940
Diff: 3
Terms: kaizen budgeting
Objective: 6
AACSB: Analytical skills
8) Building in budgetary slack includes:
A) overestimating budgeted revenues
B) underestimating budgeted costs
C) making budgeted targets more easily achievable
D) All of these answers are correct.
Answer: C
Diff: 2
Terms: budgetary slack
Objective: 6
AACSB: Reflective thinking

9) To reduce budgetary slack management may:
A) incorporate stretch or challenge targets
B) use external benchmark performance measures
C) award bonuses for achieving budgeted amounts
D) reduce projected cost targets by 10% across all areas
Answer: B
Diff: 3
Terms: budgetary slack
Objective: 6
AACSB: Analytical skills

10) A stretch budget is a budget that:
A) crosses more than one responsibility center
B) represents a challenging, but achievable level of performance
C) is impossible to implement in a cost center
D) is designed to include the effects of exchange rate fluctuations
Answer: B
Diff: 2
Terms: responsibility accounting
Objective: 6
AACSB: Reflective thinking

11) Activity-based budgeting and kaizen budgeting are really equivalent in meaning.
Answer: FALSE
Explanation: Activity-based budgeting and kaizen budgeting are not equivalent in meaning.
Diff: 2
Terms: activity-based budgeting, kaizen budgeting
Objective: 6
AACSB: Reflective thinking

12) Kaizen budgeting incorporates continuous improvement into budgeted amounts.
Answer: TRUE
Diff: 1
Terms: sensitivity analysis, kaizen budgeting
Objective: 6
AACSB: Reflective thinking
13) Companies implementing kaizen budgeting believe that employees who actually do the job have the best knowledge of how the job can be done better.
Answer: TRUE
Diff: 1
Terms: kaizen budgeting
Objective: 6
AACSB: Reflective thinking

14) The Japanese use kaizen to mean financing alternatives.
Answer: FALSE
Explanation: The Japanese use kaizen to mean continuous improvement.
Diff: 1
Terms: kaizen budgeting
Objective: 6
AACSB: Multiculturalism and diversity

15) Kaizen budgeting does NOT make sense for cost centers.
Answer: FALSE
Explanation: Kaizen budgeting can be used in any type of responsibility center.
Diff: 2
Terms: kaizen budgeting
Objective: 6
AACSB: Multiculturalism and diversity

16) Kaizen budgeting encourages major improvements rather than small incremental changes.
Answer: FALSE
Explanation: Kaizen budgeting encourages small incremental changes rather than major improvements.
Diff: 1
Terms: kaizen budgeting
Objective: 6
AACSB: Multiculturalism and diversity

17) Kaizen budgeting allows for budgeting of small incremental increases in costs each budgeting period to allow for the effects of normal inflation.
Answer: FALSE
Explanation: Kaizen budgeting allows for budgeting of small incremental decreases in costs each budgeting period.
Diff: 2
Terms: kaizen budgeting
Objective: 6
AACSB: Multiculturalism and diversity

18) Human factors are crucial parts of budgeting.
Answer: TRUE
Diff: 2
Terms: responsibility accounting
Objective: 6
AACSB: Reflective thinking
19) Budgetary slack provides management with a hedge against planned adverse circumstances. 
Answer: FALSE
Explanation: Budgetary slack provides management with a hedge against unexpected adverse circumstances.
Diff: 2
Terms: responsibility accounting
Objective: 6
AACSB: Communication

20) Most costs can be easily controlled because they are under the sole influence of one manager.
Answer: FALSE
Explanation: Few costs are clearly under the sole influence of one manager.
Diff: 3
Terms: controllable cost
Objective: 6
AACSB: Reflective thinking

21) Performance reports of responsibility centers may include uncontrollable items to influence behavior that is in alignment with corporate strategy.
Answer: TRUE
Diff: 2
Terms: controllable cost
Objective: 6
AACSB: Reflective thinking

22) When the operating budget is used as a control device, managers are less likely to be motivated to budget higher sales than actually anticipated.
Answer: TRUE
Diff: 3
Terms: operating budget, budgetary slack
Objective: 6
AACSB: Ethical reasoning

23) Budgeting slack is most likely to occur when a firm uses the budget only as a planning device and NOT for control.
Answer: FALSE
Explanation: Budgeting slack is most likely to occur when a firm uses the budget for control.
Diff: 3
Terms: controllable cost, budgetary slack
Objective: 6
AACSB: Reflective thinking
24) If a cost is considered controllable, it indicates that all aspects of the cost are under the control of the manager of the responsibility center to which that cost is assigned.
Answer: FALSE
Explanation: A controllable cost is any cost that is primarily subject to the influence of a given responsibility manager.
Diff: 2
Terms: controllable cost
Objective: 6
AACSB: Reflective thinking

25) To create greater commitment to the budget, lower-level managers should participate in creating the budget.
Answer: TRUE
Diff: 3
Terms: responsibility accounting
Objective: 6
AACSB: Ethical reasoning

26) Allscott Company is developing its budgets for 2012 and, for the first time, will use the kaizen approach. The initial 2012 income statement, based on static data from 2011, is as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (140,000 units)</td>
<td>$420,000</td>
</tr>
<tr>
<td>Less: Cost of goods sold</td>
<td>280,000</td>
</tr>
<tr>
<td>Gross margin</td>
<td>140,000</td>
</tr>
<tr>
<td>Operating expenses (includes $28,000 of depreciation)</td>
<td>112,000</td>
</tr>
<tr>
<td>Net income</td>
<td>$28,000</td>
</tr>
</tbody>
</table>

Selling prices for 2012 are expected to increase by 8%, and sales volume in units will decrease by 10%. The cost of goods sold as estimated by the kaizen approach will decline by 10% per unit. Other than depreciation, all other operating costs are expected to decline by 5%.

**Required:**
Prepare a kaizen-based budgeted income statement for 20X5.
Answer: Sales (126,000 × $3.24) $408,240
Less: COGS (126,000 × $1.80) 226,800
Gross margin 181,440
Operating expenses ($28,000 + $79,800) 107,800
Net income $ 73,640
Diff: 2
Terms: kaizen budgeting, sensitivity analysis
Objective: 4, 6
AACSB: Analytical skills
27) Steve Corporation is using the kaizen approach to budgeting for 2011. The budgeted income statement for January 2011 is as follows:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (240,000 units)</td>
<td>$360,000</td>
</tr>
<tr>
<td>Less: Cost of goods sold</td>
<td>240,000</td>
</tr>
<tr>
<td>Gross margin</td>
<td>120,000</td>
</tr>
<tr>
<td>Operating expenses</td>
<td>96,000</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Net income</td>
<td>$ 24,000</td>
</tr>
</tbody>
</table>

Under the kaizen approach, cost of goods sold and variable operating expenses are budgeted to decline by 1% per month.

**Required:**
Prepare a kaizen-based budgeted income statement for March of 2011.

**Answer:**
Sales $360,000
Less: Cost of goods sold ($240,000 × 0.99 × 0.99) 235,224
Gross margin 124,776
Operating expenses [($64,000 × 0.99 × 0.99) + $32,000] 94,726
Net income $ 30,050

Diff: 2
Terms: kaizen budgeting
Objective: 6
AACSB: Analytical skills

28) Describe the concept of kaizen budgeting.

**Answer:** Kaizen budgeting explicitly incorporates continuous improvement in cost reduction anticipated during the budget period. Much of the cost reduction arises from many small improvements rather than large one time improvements. Most of the improvements come from employee suggestions. Companies that employ kaizen budgeting create a culture where employee suggestions are valued, recognized, and rewarded.

Diff: 2
Terms: kaizen budgeting
Objective: 6
AACSB: Reflective thinking
29) Describe some of the drawbacks of using the operating budget as a control device.
Answer: When the operating budget is used as a control device it can lead to behavior that is actually
detrimental to the organization.

The major problem with the budget performance report is not the report itself, but rather the way it is
used. In general, managers are rewarded for favorable variances, and disciplined for unfavorable
variances. This encourages managers to set lax standards for both sales and costs so favorable variances
result. It can also lead to "budget games."

Another drawback is that once the budget is established, if there is any variance between budget and
actual, it is assumed to be because of actual. However, as we know, the budget will never be totally
accurate due to the uncertainties of predicting the future.

If used properly, however, the operating budget can be a tremendous benefit to any company.
Diff: 2
Terms: operating budget
Objective: 6
AACSB: Reflective thinking

30) What is budget slack? What are the pros and cons of building slack into the budget from the point of
view of (a) an employee and (b) a senior manager?
Answer: Budget slack occurs when subordinates (a) ask for excess resources above and beyond what
they need to accomplish budget objectives and (b) distort information by claiming they are not as
efficient or effective at what they do, thus lowering management's performance expectations of them.

Employee's point of view: There are two benefits from this point of view. First, the subordinate may be
able to obtain excess resources to achieve desired goals. This may take a lot of pressure off the
subordinate and reduce job anxiety. Second, the subordinate may be able to convince senior
management to lower their work expectations of him or her. This may also lead to lower pressure on the
subordinate to perform. Both of these types of slack building are designed to reduce job stress for the
subordinate. However, if incentives are graduated in such a way that achieving higher and higher goals
provides the subordinate with more and more compensation in the form of bonuses, then the subordinate
may lose income by selecting lower goals.

Senior management's point of view: When subordinates build in slack, they are either using
unnecessary resources to achieve a goal that they should have been able to achieve with fewer resources,
or they are understating their performance capabilities. Thus, the organization is either not running as
efficiently as it can, or is losing potential productivity from employees who are not working as hard as
they can. In some cases, senior management may believe that subordinates build in slack to relieve job
pressure. If burnout of employees has been happening in the organization, then perhaps senior
management may be more forgiving and view some slack building as necessary to keep their employees
from quitting.
Diff: 2
Terms: budgetary slack
Objective: 6
AACSB: Reflective thinking
31) How is budgeting for a multinational corporation different than budgeting for a corporation that is strictly domestic?  
Answer: Budgeting for a multinational corporation is made far more complex than budgeting for a domestic corporation because the multinational corporation often has subunits operating in many different countries, resulting in less familiar business environments and many different currencies. 
Multinational corporations need to understand many different business environments with significant political, legal, and economic environments. 
Multinational companies earn their revenues and incur their expenses in many different currencies, and must report their results a single currency. Additionally, management accountants in different countries need to budget for foreign exchange rates and anticipate changes that might take place during the year in the face of constantly fluctuating exchange rates. 

Diff: 2  
Terms: responsibility accounting  
Objective: 6  
AACSB: Reflective thinking  

Objective 6.6

1) Multinational budgeting is more complex than budgeting in a domestic environment due to the possibility of: 
A) exchange rate fluctuations  
B) sophisticated techniques used by multinationals such as forward, future, and options contracts  
C) different political, legal, and economic environments faced by multinationals  
D) All of these answers are correct.  
Answer: D  
Diff: 2  
Terms: responsibility accounting  
Objective: 7  
AACSB: Multiculturalism and diversity

2) Multinational budgeting is useful for everything EXCEPT: 
A) comparing actual to budget in volatile conditions  
B) helping managers learn and adapt to changing conditions  
C) determining the impact of currency fluctuations  
D) determining how well managers adapt to uncertain environments  
Answer: A  
Diff: 2  
Terms: responsibility accounting  
Objective: 7  
AACSB: Multiculturalism and diversity

3) Budgeting for a multinational company is made more complex due to the possibility of exchange rate fluctuations.  
Answer: TRUE  
Diff: 2  
Terms: responsibility accounting  
Objective: 7  
AACSB: Multiculturalism and diversity
4) The possibility of exchange rate fluctuations does NOT influence the budgeting procedures in a multinational corporation.
Answer: FALSE
Explanation: The possibility of exchange rate fluctuations influences the budgeting procedures in a multinational corporation.
Diff: 2
Terms: responsibility accounting
Objective: 7
AACSB: Multiculturalism and diversity

5) Because of the possibility of exchange rate fluctuations, managers of multinational corporations should ignore subjective factors in their performance evaluations.
Answer: FALSE
Explanation: The possibility of exchange rate fluctuations increases the importance of subjective factors in performance evaluations of multinational corporations.
Diff: 2
Terms: responsibility accounting
Objective: 7
AACSB: Multiculturalism and diversity

Objective 6.A

1) To prepare the cash budget, all of the following budgets are required EXCEPT:
   A) capital expenditures budget
   B) cost of goods sold budget
   C) budgeted balance sheet
   D) revenue budget
Answer: C
Diff: 2
Terms: cash budget
Objective: A
AACSB: Reflective thinking

2) Financial analysts use the projected cash flow statement to do all of the following EXCEPT:
   A) plan for when excess cash is generated
   B) plan for short-term cash investments
   C) project cash shortages and plan a strategy to deal with the shortages
   D) project depreciation expense
Answer: D
Diff: 2
Terms: cash budget
Objective: A
AACSB: Reflective thinking
3) The cash flow statement does NOT include:
A) cash inflows from the collection of receivables
B) cash outflows paid toward raw material purchases
C) all sales revenues
D) interest paid and received
Answer: C
Diff: 2
Terms: cash budget
Objective: A
AACSB: Reflective thinking

4) The cash budget is a schedule of expected cash receipts and disbursements that:
A) requires an aging of accounts receivable and accounts payable
B) is a self-liquidating cycle
C) is prepared immediately after the sales forecast
D) predicts the effect on the cash position at given levels of operations
Answer: D
Diff: 1
Terms: cash budget
Objective: A
AACSB: Reflective thinking
Answer the following questions using the information below:

The following information pertains to Hepburn Company:

<table>
<thead>
<tr>
<th>Month</th>
<th>Sales</th>
<th>Purchases</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>$60,000</td>
<td>$32,000</td>
</tr>
<tr>
<td>February</td>
<td>$80,000</td>
<td>$40,000</td>
</tr>
<tr>
<td>March</td>
<td>$100,000</td>
<td>$56,000</td>
</tr>
</tbody>
</table>

- Cash is collected from customers in the following manner:
  - Month of sale 30%
  - Month following the sale 70%
- 40% of purchases are paid for in cash in the month of purchase, and the balance is paid the following month.
- Labor costs are 20% of sales. Other operating costs are $30,000 per month (including $8,000 of depreciation). Both of these are paid in the month incurred.
- The cash balance on March 1 is $8,000. A minimum cash balance of $6,000 is required at the end of the month. Money can be borrowed in multiples of $1,000.

5) How much cash will be collected from customers in March?
   A) $94,000
   B) $86,000
   C) $100,000
   D) None of these answers are correct.

   Answer: B
   Explanation: B) ($80,000 × 70%) + ($100,000 × 30%) = $86,000
   Diff: 2
   Terms: cash budget
   Objective: A
   AACSB: Analytical skills

6) How much cash will be paid to suppliers in March?
   A) $46,400
   B) $56,000
   C) $88,000
   D) None of these answers are correct.

   Answer: A
   Explanation: A) ($40,000 × 60%) + ($56,000 × 40%) = $46,400
   Diff: 2
   Terms: cash budget
   Objective: A
   AACSB: Analytical skills
7) How much cash will be disbursed in total in March?
A) $42,000
B) $50,000
C) $88,400
D) $96,400
Answer: C
Explanation: C) ($40,000 \times 60\%) + ($56,000 \times 40\%) + ($100,000 \times 20\%) + ($30,000 - $8,000) = $88,400
Diff: 2
Terms: cash budget
Objective: A
AACSB: Analytical skills

8) What is the ending cash balance for March?
A) ($50,000)
B) $6,000
C) $5,600
D) $6,600
Answer: D
Explanation: D) $8,000 + $86,000 - $88,400 + $1,000 = $6,600
Diff: 2
Terms: cash budget
Objective: A
AACSB: Analytical skills

Answer the following questions using the information below:

Monetary Company has the following sales budget for the last six months of 2011:

<table>
<thead>
<tr>
<th>Month</th>
<th>Sales Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
<td>$200,000</td>
</tr>
<tr>
<td>August</td>
<td>$160,000</td>
</tr>
<tr>
<td>September</td>
<td>$220,000</td>
</tr>
<tr>
<td>October</td>
<td>$180,000</td>
</tr>
<tr>
<td>November</td>
<td>$200,000</td>
</tr>
<tr>
<td>December</td>
<td>$188,000</td>
</tr>
</tbody>
</table>

Historically, the cash collection of sales has been as follows:
- 65\% of sales collected in the month of sale,
- 25\% of sales collected in the month following the sale,
- 8\% of sales collected in the second month following the sale, and
- 2\% of sales are uncollectible.

9) Cash collections for September are:
A) $143,000
B) $173,400
C) $199,000
D) $204,000
Answer: C
Explanation: C) ($220,000 \times 0.65) + ($160,000 \times 0.25) + ($200,000 \times 0.08) = $199,000
Diff: 2
Terms: cash budget
Objective: A
AACSB: Analytical skills
10) What is the ending balance of accounts receivable for September, assuming uncollectible balances are written off during the second month following the sale?
   A) $199,000
   B) $97,000
   C) $89,800
   D) $93,000
   Answer: D
   Explanation: D) ($220,000 × 0.35) + ($160,000 × 0.10) = $93,000
   Diff: 2
   Terms: cash budget
   Objective: A
   AACSB: Analytical skills

11) Cash collections for October are:
   A) $117,000
   B) $184,800
   C) $199,000
   D) $176,400
   Answer: B
   Explanation: B) ($180,000 × 0.65) + ($220,000 × 0.25) + ($160,000 × 0.08) = $184,800
   Diff: 2
   Terms: cash budget
   Objective: A
   AACSB: Analytical skills
Answer the following questions using the information below:

Bear Company has the following information:

<table>
<thead>
<tr>
<th>Month</th>
<th>Budgeted Purchases</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>$26,800</td>
</tr>
<tr>
<td>February</td>
<td>29,000</td>
</tr>
<tr>
<td>March</td>
<td>30,520</td>
</tr>
<tr>
<td>April</td>
<td>29,480</td>
</tr>
<tr>
<td>May</td>
<td>27,680</td>
</tr>
</tbody>
</table>

Purchases are paid for in the following manner:
- 10% of the purchase amount in the month of purchase
- 50% of the purchase amount in the month after purchase
- 40% of the purchase amount in the month after purchase

12) What is the expected balance in Accounts Payable as of March 31?
A) $39,068
B) $18,312
C) $2,900
D) $30,520
Answer: A
Explanation: A) \((30,520 \times 0.9) + (29,000 \times 0.4) = 39,068\)
Diff: 2
Terms: cash budget
Objective: A
AACSB: Analytical skills

13) What is the expected balance in Accounts Payable as of April 30?
A) $26,532
B) $38,740
C) $12,208
D) $17,688
Answer: B
Explanation: B) \((29,480 \times 0.9) + (30,520 \times 0.4) = 38,740\)
Diff: 2
Terms: cash budget
Objective: A
AACSB: Analytical skills
14) What is the expected Accounts Payable balance as of May 31?
A) $11,792
B) $24,912
C) $36,704
D) $2,948
Answer: C
Explanation: C) ($27,680 × 0.9) + ($29,480 × 0.4) = $36,704
Diff: 2
Terms: cash budget
Objective: A
AACSB: Analytical skills

Answer the following questions using the information below:

The following information pertains to the January operating budget for Casey Corporation.

- Budgeted sales for January $100,000 and February $200,000.
- Collections for sales are 60% in the month of sale and 40% the next month.
- Gross margin is 30% of sales.
- Administrative costs are $10,000 each month
- Beginning accounts receivable is $20,000.
- Beginning inventory is $14,000.
- Beginning accounts payable is $60,000. (All from inventory purchases.)
- Purchases are paid in full the following month.
- Desired ending inventory is 20% of next month's cost of goods sold (COGS).

15) For January, budgeted cash collections are:
A) $20,000
B) $60,000
C) $80,000
D) None of these answers are correct.
Answer: C
Explanation: C) $20,000 + ($100,000 × 60%) = $80,000
Diff: 3
Terms: cash budget
Objective: A
AACSB: Analytical skills

16) At the end of January, budgeted accounts receivable is:
A) $20,000
B) $40,000
C) $60,000
D) None of these answers are correct.
Answer: B
Explanation: B) $100,000 × 40% = $40,000
Diff: 2
Terms: cash budget
Objective: A
AACSB: Analytical skills
17) For January, budgeted cost of goods sold is:
A) $20,000
B) $30,000
C) $40,000
D) None of these answers are correct.
Answer: D
Explanation: D) $100,000 × 70% = $70,000
Diff: 3
Terms: cash budget
Objective: A
AACSB: Analytical skills

18) For January, budgeted net income is:
A) $20,000
B) $30,000
C) $40,000
D) None of these answers are correct.
Answer: A
Explanation: A) $100,000 - $70,000 - $10,000 = $20,000
Diff: 3
Terms: cash budget
Objective: A
AACSB: Analytical skills

19) For January, budgeted cash payments for purchases are:
A) $14,000
B) $70,000
C) $60,000
D) None of these answers are correct.
Answer: C
Explanation: C) Accounts payable, $60,000 as stated
Diff: 2
Terms: cash budget
Objective: A
AACSB: Analytical skills

20) At the end of January, budgeted ending inventory is:
A) $20,000
B) $28,000
C) $40,000
D) None of these answers are correct.
Answer: B
Explanation: B) $200,000 × 70% × 20% = $28,000
Diff: 3
Terms: cash budget
Objective: A
AACSB: Analytical skills
21) A key use of sensitivity analysis is for cash-flow budgeting.
Answer: TRUE
Diff: 1
Terms: sensitivity analysis, cash budget
Objective: A
AACSB: Analytical skills

22) The self-liquidating cycle is the movement from cash to inventories to receivables and back to cash.
Answer: TRUE
Diff: 1
Terms: cash budget
Objective: A
AACSB: Reflective thinking

23) Russell Company has the following projected account balances for June 30, 2011:

<table>
<thead>
<tr>
<th>Account</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts payable</td>
<td>$80,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>200,000</td>
</tr>
<tr>
<td>Depreciation, factory</td>
<td>48,000</td>
</tr>
<tr>
<td>Inventories (5/31 &amp; 6/30)</td>
<td>360,000</td>
</tr>
<tr>
<td>Direct materials used</td>
<td>400,000</td>
</tr>
<tr>
<td>Office salaries</td>
<td>160,000</td>
</tr>
<tr>
<td>Insurance, factory</td>
<td>8,000</td>
</tr>
<tr>
<td>Plant wages</td>
<td>280,000</td>
</tr>
<tr>
<td>Bonds payable</td>
<td>320,000</td>
</tr>
<tr>
<td>Sales</td>
<td>$1,600,000</td>
</tr>
<tr>
<td>Capital stock</td>
<td>800,000</td>
</tr>
<tr>
<td>Retained earnings</td>
<td>?</td>
</tr>
<tr>
<td>Cash</td>
<td>112,000</td>
</tr>
<tr>
<td>Equipment, net</td>
<td>480,000</td>
</tr>
<tr>
<td>Buildings, net</td>
<td>800,000</td>
</tr>
<tr>
<td>Utilities, factory</td>
<td>32,000</td>
</tr>
<tr>
<td>Selling expenses</td>
<td>120,000</td>
</tr>
<tr>
<td>Maintenance, factory</td>
<td>56,000</td>
</tr>
<tr>
<td>Maintenance, factory</td>
<td>56,000</td>
</tr>
<tr>
<td>Utilities</td>
<td>32,000</td>
</tr>
<tr>
<td>Bonds payable</td>
<td>320,000</td>
</tr>
<tr>
<td>Equipment, factory</td>
<td>480,000</td>
</tr>
<tr>
<td>Buildings, net</td>
<td>800,000</td>
</tr>
<tr>
<td>Utilities, factory</td>
<td>32,000</td>
</tr>
<tr>
<td>Selling expenses</td>
<td>120,000</td>
</tr>
<tr>
<td>Office salaries</td>
<td>160,000</td>
</tr>
<tr>
<td>Maintenance, factory</td>
<td>56,000</td>
</tr>
<tr>
<td>Utilities</td>
<td>32,000</td>
</tr>
<tr>
<td>Bonds payable</td>
<td>320,000</td>
</tr>
<tr>
<td>Equipment, factory</td>
<td>480,000</td>
</tr>
<tr>
<td>Buildings, net</td>
<td>800,000</td>
</tr>
<tr>
<td>Utilities, factory</td>
<td>32,000</td>
</tr>
<tr>
<td>Selling expenses</td>
<td>120,000</td>
</tr>
<tr>
<td>Office salaries</td>
<td>160,000</td>
</tr>
<tr>
<td>Maintenance, factory</td>
<td>56,000</td>
</tr>
<tr>
<td>Utilities</td>
<td>32,000</td>
</tr>
<tr>
<td>Bonds payable</td>
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</tr>
<tr>
<td>Equipment, factory</td>
<td>480,000</td>
</tr>
<tr>
<td>Buildings, net</td>
<td>800,000</td>
</tr>
<tr>
<td>Utilities, factory</td>
<td>32,000</td>
</tr>
<tr>
<td>Selling expenses</td>
<td>120,000</td>
</tr>
<tr>
<td>Office salaries</td>
<td>160,000</td>
</tr>
<tr>
<td>Maintenance, factory</td>
<td>56,000</td>
</tr>
<tr>
<td>Utilities</td>
<td>32,000</td>
</tr>
<tr>
<td>Bonds payable</td>
<td>320,000</td>
</tr>
<tr>
<td>Equipment, factory</td>
<td>480,000</td>
</tr>
<tr>
<td>Buildings, net</td>
<td>800,000</td>
</tr>
<tr>
<td>Utilities, factory</td>
<td>32,000</td>
</tr>
<tr>
<td>Selling expenses</td>
<td>120,000</td>
</tr>
<tr>
<td>Office salaries</td>
<td>160,000</td>
</tr>
<tr>
<td>Maintenance, factory</td>
<td>56,000</td>
</tr>
<tr>
<td>Utilities</td>
<td>32,000</td>
</tr>
</tbody>
</table>

**Required:**
a. Prepare a budgeted income statement for June 2011

Answer:
a. Russell Company
Budgeted Income Statement
For the Month of June 2011

Sales $1,600,000

Cost of goods sold:
- Materials used $400,000
- Wages 280,000
- Depreciation 48,000
- Insurance 8,000
- Maintenance 56,000
- Utilities 32,000
- Gross profit 776,000

Operating expenses:
- Selling expenses $120,000
- Office salaries 160,000 280,000
- Net income $496,000

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Assets:  Liabilities and Owners' Equity:

Cash $112,000  Accounts payable $80,000
Accounts receivable 200,000  Bonds payable 320,000
Inventories 360,000  Capital stock 800,000
Equipment, net 480,000  Retained earnings* 752,000
Buildings, net 800,000
Total $1,952,000  Total $1,952,000

*$1,952,000 - ($80,000 + $320,000 + $800,000) = $752,000
Diff: 2
Terms: operating budget
Objective: 3, A
AACSB: Analytical skills

24) Duffy Corporation has prepared the following sales budget:

<table>
<thead>
<tr>
<th>Month</th>
<th>Cash Sales</th>
<th>Credit Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>May</td>
<td>$16,000</td>
<td>$68,000</td>
</tr>
<tr>
<td>June</td>
<td>20,000</td>
<td>80,000</td>
</tr>
<tr>
<td>July</td>
<td>18,000</td>
<td>74,000</td>
</tr>
<tr>
<td>August</td>
<td>24,000</td>
<td>92,000</td>
</tr>
<tr>
<td>September</td>
<td>22,000</td>
<td>76,000</td>
</tr>
</tbody>
</table>

Collections are 40% in the month of sale, 45% in the month following the sale, and 10% two months following the sale. The remaining 5% is expected to be uncollectible.

**Required:**
Prepare a schedule of cash collections for July through September.

<table>
<thead>
<tr>
<th></th>
<th>July</th>
<th>August</th>
<th>September</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash sales</td>
<td>$18,000</td>
<td>$24,000</td>
<td>$22,000</td>
<td>$64,000</td>
</tr>
</tbody>
</table>

Collections of credit sales from:

- Current month 29,600 36,800 30,400 96,800
- Previous month 36,000 33,300 41,400 110,700
- Two months ago 6,800 8,000 7,400 22,200

Total collections $90,400 $102,100 $101,200 $293,700
Diff: 2
Terms: cash budget
Objective: A
AACSB: Analytical skills
25) The following information pertains to Amigo Corporation:

<table>
<thead>
<tr>
<th>Month</th>
<th>Sales</th>
<th>Purchases</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
<td>$30,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>August</td>
<td>34,000</td>
<td>12,000</td>
</tr>
<tr>
<td>September</td>
<td>38,000</td>
<td>14,000</td>
</tr>
<tr>
<td>October</td>
<td>42,000</td>
<td>16,000</td>
</tr>
<tr>
<td>November</td>
<td>48,000</td>
<td>18,000</td>
</tr>
<tr>
<td>December</td>
<td>60,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>

- Cash is collected from customers in the following manner:
  - Month of sale (2% cash discount) 30%
  - Month following sale 50%
  - Two months following sale 15%
  - Amount uncollectible 5%
- 40% of purchases are paid for in cash in the month of purchase, and the balance is paid the following month.

**Required:**

a. Prepare a summary of cash collections for the 4th quarter.
b. Prepare a summary of cash disbursements for the 4th quarter.

**Answer:**

a. Cash collections Oct $36,448 + Nov $40,812 + Dec $47,940 = $125,200

<table>
<thead>
<tr>
<th></th>
<th>October</th>
<th>November</th>
<th>December</th>
</tr>
</thead>
<tbody>
<tr>
<td>August</td>
<td>$ 5,100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>September</td>
<td>19,000</td>
<td>5,700</td>
<td></td>
</tr>
<tr>
<td>October</td>
<td>12,348</td>
<td>21,000</td>
<td>6,300</td>
</tr>
<tr>
<td>November</td>
<td>14,112</td>
<td></td>
<td>24,000</td>
</tr>
<tr>
<td>December</td>
<td></td>
<td>17,640</td>
<td></td>
</tr>
<tr>
<td></td>
<td>$36,448</td>
<td>$40,812</td>
<td>$47,940</td>
</tr>
</tbody>
</table>

b. Cash disbursements Oct $14,800 + Nov $16,800 + Dec $18,800 = $50,400

<table>
<thead>
<tr>
<th></th>
<th>October</th>
<th>November</th>
<th>December</th>
</tr>
</thead>
<tbody>
<tr>
<td>September</td>
<td>8,400</td>
<td>9,600</td>
<td></td>
</tr>
<tr>
<td>October</td>
<td>6,400</td>
<td>7,200</td>
<td>10,800</td>
</tr>
<tr>
<td>November</td>
<td></td>
<td>8,000</td>
<td></td>
</tr>
<tr>
<td>December</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$14,800</td>
<td>$16,800</td>
<td>$18,800</td>
</tr>
</tbody>
</table>

Diff: 2
Terms: cash budget
Objective: A
AACSB: Analytical skills
Objective 7.1

1) The master budget is:
A) a flexible budget
B) a static budget
C) developed at the end of the period
D) based on the actual level of output
Answer: B
Diff: 1
Terms: static budget
Objective: 1
AACSB: Reflective thinking

2) A flexible budget:
A) is another name for management by exception
B) is developed at the end of the period
C) is based on the budgeted level of output
D) provides favorable operating results
Answer: B
Diff: 1
Terms: flexible budget
Objective: 1
AACSB: Reflective thinking

3) Management by exception is the practice of concentrating on:
A) the master budget
B) areas not operating as anticipated
C) favorable variances
D) unfavorable variances
Answer: B
Diff: 1
Terms: management by exception
Objective: 1
AACSB: Reflective thinking

4) A variance is:
A) the gap between an actual result and a benchmark amount
B) the required number of inputs for one standard output
C) the difference between an actual result and a budgeted amount
D) the difference between a budgeted amount and a standard amount
Answer: C
Diff: 1
Terms: variance
Objective: 1
AACSB: Reflective thinking
5) An unfavorable variance indicates that:
A) actual costs are less than budgeted costs
B) actual revenues exceed budgeted revenues
C) the actual amount decreased operating income relative to the budgeted amount
D) All of these answers are correct.
Answer: C
Diff: 2
Terms: unfavorable variance
Objective: 1
AACSB: Reflective thinking

6) A favorable variance indicates that:
A) budgeted costs are less than actual costs
B) actual revenues exceed budgeted revenues
C) the actual amount decreased operating income relative to the budgeted amount
D) All of these answers are correct.
Answer: B
Diff: 2
Terms: favorable variance
Objective: 1
AACSB: Reflective thinking

Answer the following questions using the information below:

Bowden Corporation used the following data to evaluate their current operating system. The company sells items for $20 each and used a budgeted selling price of $20 per unit.

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Budgeted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units sold</td>
<td>46,000 units</td>
<td>45,000 units</td>
</tr>
<tr>
<td>Variable costs</td>
<td>$225,400</td>
<td>$216,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>$47,500</td>
<td>$50,000</td>
</tr>
</tbody>
</table>

7) What is the static-budget variance of revenues?
A) $20,000 favorable
B) $20,000 unfavorable
C) $2,000 favorable
D) $2,000 unfavorable
Answer: A
Explanation: A) (46,000 units × $20) - (45,000 units × $20) = $20,000 F
Diff: 2
Terms: static-budget variance
Objective: 1
AACSB: Analytical skills
8) What is the static-budget variance of variable costs?
A) $1,200 favorable
B) $9,400 unfavorable
C) $20,000 favorable
D) $1,200 unfavorable
Answer: B
Explanation: B) $225,400 - $216,000 = $9,400 U
Diff: 2
Terms: static-budget variance
Objective: 1
AACSB: Analytical skills

9) What is the static-budget variance of operating income?
A) $10,600 favorable
B) $10,600 unfavorable
C) $13,100 favorable
D) $13,100 unfavorable
Answer: C
Explanation:

\[
\begin{array}{|c|c|c|c|}
\hline
& \text{Actual Results} & \text{Static Budget} & \text{Static-budget Variance} \\
\hline
\text{Units sold} & 46,000 & 45,000 & \\
\text{Revenues} & 920,000 & 900,000 & 20,000 F \\
\text{Variable costs} & 225,400 & 216,000 & 9,400 U \\
\text{Contribution margin} & 694,600 & 684,000 & 10,600 F \\
\text{Fixed costs} & 47,500 & 50,000 & (2,500) F \\
\text{Operating income} & 647,100 & 634,000 & 13,100 F \\
\hline
\end{array}
\]
Diff: 2
Terms: static-budget variance
Objective: 1
AACSB: Analytical skills
Answer the following questions using the information below:

Caan Corporation used the following data to evaluate their current operating system. The company sells items for $20 each and used a budgeted selling price of $20 per unit.

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Budgeted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units sold</td>
<td>200,000</td>
<td>203,000</td>
</tr>
<tr>
<td>Variable costs</td>
<td>$1,250,000</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>$925,000</td>
<td>$900,000</td>
</tr>
</tbody>
</table>

10) What is the static-budget variance of revenues?
   A) $60,000 favorable
   B) $60,000 unfavorable
   C) $6,000 favorable
   D) $6,000 unfavorable
   Answer: B
   Explanation: B) (200,000 units × $20) - (203,000 units × $20) = $60,000 U
   Diff: 2
   Terms: static-budget variance
   Objective: 1
   AACSB: Analytical skills

11) What is the static-budget variance of variable costs?
   A) $200,000 favorable
   B) $50,000 unfavorable
   C) $250,000 favorable
   D) $250,000 unfavorable
   Answer: C
   Explanation: C) $1,250,000 - $1,500,000 = $250,000 F
   Diff: 2
   Terms: static-budget variance
   Objective: 1
   AACSB: Analytical skills
12) What is the static-budget variance of operating income?  
A) $165,000 favorable  
B) $190,000 unfavorable  
C) $60,000 favorable  
D) $60,000 unfavorable  
Answer: A  
Explanation:  

<table>
<thead>
<tr>
<th></th>
<th>Actual Results</th>
<th>Static Budget</th>
<th>Static-budget Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units sold</td>
<td>200,000</td>
<td>203,000</td>
<td></td>
</tr>
<tr>
<td>Revenues</td>
<td>$4,000,000</td>
<td>$4,060,000</td>
<td>$(60,000) U</td>
</tr>
<tr>
<td>Variable costs</td>
<td>1,250,000</td>
<td>1,500,000</td>
<td>(250,000) F</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$2,750,000</td>
<td>$2,560,000</td>
<td>190,000 F</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>925,000</td>
<td>900,000</td>
<td>25,000 U</td>
</tr>
<tr>
<td>Operating income</td>
<td>$1,825,000</td>
<td>$1,660,000</td>
<td>$165,000 F</td>
</tr>
</tbody>
</table>

Diff: 2  
Terms: static-budget variance  
Objective: 1  
AACSB: Analytical skills  

Answer the following questions using the information below:  

Everclean Filter Corporation used the following data to evaluate their current operating system. The company sells items for $10 each and had used a budgeted selling price of $11 per unit.  

<table>
<thead>
<tr>
<th>Actual</th>
<th>Budgeted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units sold</td>
<td>306,000 units</td>
</tr>
<tr>
<td>Variable costs</td>
<td>$965,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>$53,000</td>
</tr>
</tbody>
</table>

13) What is the static-budget variance of revenues?  
A) $60,000 favorable  
B) $30,000 unfavorable  
C) $30,000 favorable  
D) $6,000 favorable  
Answer: C  
Explanation:  
C) (306,000 units × $10) - (300,000 units × $11) = $30,000 F  
Diff: 2  
Terms: static-budget variance  
Objective: 1  
AACSB: Analytical skills
14) What is the static-budget variance of variable costs?
A) $13,000 favorable
B) $13,000 unfavorable
C) $15,000 favorable
D) $15,000 unfavorable
Answer: D
Explanation: D) $965,000 - $950,000 = $15,000 U
Diff: 2
Terms: static-budget variance
Objective: 1
AACSB: Analytical skills

15) What is the static-budget variance of operating income?
A) $12,000 unfavorable
B) $12,000 favorable
C) $15,000 favorable
D) $15,000 unfavorable
Answer: B
Diff: 2
Terms: static-budget variance
Objective: 1
AACSB: Analytical skills

16) Regier Company had planned for operating income of $10 million in the master budget but actually achieved operating income of only $7 million.
A) The static-budget variance for operating income is $3 million favorable.
B) The static-budget variance for operating income is $3 million unfavorable.
C) The flexible-budget variance for operating income is $3 million favorable.
D) The flexible-budget variance for operating income is $3 million unfavorable.
Answer: B
Diff: 2
Terms: static-budget variance, flexible-budget variance
Objective: 1
AACSB: Analytical skills

17) The master budget is one type of flexible budget.
Answer: FALSE
Explanation: The master budget is a static budget.
Diff: 1
Terms: flexible budget
Objective: 1
AACSB: Reflective thinking

18) A flexible budget is calculated at the end of the budget period.
Answer: TRUE
Diff: 1
Terms: flexible budget
Objective: 1
AACSB: Reflective thinking
19) Information regarding the causes of variances is provided when the master budget is compared with actual results.
   Answer: FALSE
   Explanation: Little information regarding the causes of variances is provided when the master budget is compared with actual results because you are comparing a budget for one level of activity with actual costs for a different level of activity.
   Diff: 2
   Terms: variance
   Objective: 1
   AACSB: Reflective thinking

20) A variance is the difference between the actual cost for the current and expected (or budgeted) performance.
   Answer: TRUE
   Diff: 2
   Terms: variance
   Objective: 1
   AACSB: Reflective thinking

21) A favorable variance results when actual costs exceed budgeted costs.
   Answer: FALSE
   Explanation: An unfavorable variance results when actual costs exceed budgeted costs.
   Diff: 2
   Terms: favorable variance
   Objective: 1
   AACSB: Reflective thinking

22) Management by exception is the practice of concentrating on areas not operating as anticipated (such as a cost overrun) and placing less attention on areas operating as anticipated.
   Answer: TRUE
   Diff: 1
   Terms: management by exception
   Objective: 1
   AACSB: Reflective thinking

23) The essence of variance analysis is to capture a departure from what was expected.
   Answer: TRUE
   Diff: 1
   Terms: variance
   Objective: 1
   AACSB: Reflective thinking

24) A favorable variance should be ignored by management.
   Answer: FALSE
   Explanation: Favorable variance investigation may lead to improved production methods, other discoveries for future opportunities, or not be good news at all and adversely affect other variances.
   Diff: 1
   Terms: favorable variance
   Objective: 1
   AACSB: Reflective thinking
25) An unfavorable variance may be due to poor planning rather than due to inefficiency.
Answer: TRUE
Diff: 2
Terms: unfavorable variance
Objective: 1
AACSB: Communication

26) Explain the difference between a static budget and a flexible budget. Explain what is meant by a static budget variance and a flexible budget variance.
Answer: A static budget is one based on the level of output planned at the start of the budget period. A flexible budget calculates budgeted revenue and budgeted costs based on the actual output in the budget period. The only difference between the static budget and the flexible budget is that the static budget is prepared for the planned output, whereas the flexible budget is prepared based on the actual output.

A static budget variance is the difference between the actual results and the corresponding budgeted amounts in the static budget. A flexible-budget variance is the difference between an actual result and the corresponding flexible-budget amount based on the actual output in the budget period.
Diff: 2
Terms: static budget, flexible budget
Objective: 1
AACSB: Reflective thinking

Objective 7.2

1) The flexible budget contains:
A) budgeted amounts for actual output
B) budgeted amounts for planned output
C) actual costs for actual output
D) actual costs for planned output
Answer: A
Diff: 1
Terms: flexible budget
Objective: 2
AACSB: Reflective thinking

2) The following items are the same for the flexible budget and the master budget EXCEPT for:
A) variable cost per unit
B) total fixed costs
C) units sold
D) sales price per unit
Answer: C
Diff: 2
Terms: flexible budget
Objective: 2
AACSB: Reflective thinking
3) The sales-volume variance is due to:
A) using a different selling price from that budgeted
B) inaccurate forecasting of units sold
C) poor production performance
D) Both A and B are correct.
Answer: B
Diff: 2
Terms: sales-volume variance
Objective: 2
AACSB: Reflective thinking

4) An unfavorable sales-volume variance could result from:
A) decreased demand for the product
B) competitors taking market share
C) customer dissatisfaction with the product
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: sales-volume variance
Objective: 2
AACSB: Reflective thinking

5) If a sales-volume variance was caused by poor-quality products, then the ________ would be in the best position to explain the variance.
A) production manager
B) sales manager
C) purchasing manager
D) management accountant
Answer: A
Diff: 2
Terms: sales-volume variance
Objective: 2
AACSB: Reflective thinking

6) The variance that is best for measuring operating performance is the:
A) static-budget variance
B) flexible-budget variance
C) sales-volume variance
D) selling-price variance
Answer: B
Diff: 2
Terms: flexible-budget variance
Objective: 2
AACSB: Reflective thinking
7) An unfavorable flexible-budget variance for variable costs may be the result of:
A) using more input quantities than were budgeted
B) paying higher prices for inputs than were budgeted
C) selling output at a higher selling price than budgeted
D) Both A and B are correct.
Answer: D
Diff: 3
Terms: flexible-budget variance
Objective: 2
AACSB: Reflective thinking

8) An unfavorable variance:
A) may suggest investigation is needed
B) is conclusive evidence of poor performance
C) demands that standards be recomputed
D) indicates continuous improvement is needed
Answer: A
Diff: 2
Terms: unfavorable variance
Objective: 2
AACSB: Reflective thinking

9) All of the following are needed to prepare a flexible budget EXCEPT determining the:
A) budgeted variable cost per output unit
B) budgeted fixed costs
C) actual selling price per unit
D) actual quantity of output units
Answer: C
Diff: 3
Terms: flexible budget
Objective: 2
AACSB: Reflective thinking

10) The variance that LEAST affects cost control is the:
A) flexible-budget variance
B) direct-material-price variance
C) sales-volume variance
D) direct manufacturing labor efficiency variance
Answer: C
Diff: 2
Terms: sales-volume variance
Objective: 2
AACSB: Reflective thinking
11) A flexible-budget variance is $600 favorable for unit-related costs. This indicates that costs were:
A) $600 more than the master budget
B) $600 less than for the planned level of activity
C) $600 more than standard for the achieved level of activity
D) $600 less than standard for the achieved level of activity
Answer: D
Diff: 2
Terms: flexible-budget variance
Objective: 2
AACSB: Analytical skills

Answer the following questions using the information below:

JJ Abrams planned to use $164 of material per unit but actually used $160 of material per unit, and planned to make 1,200 units but actually made 1,000 units.

12) The flexible-budget amount is:
A) $160,000
B) $164,000
C) $192,000
D) $196,800
Answer: B
Explanation: B) 1,000 units × $164 = $164,000
Diff: 2
Terms: flexible budget
Objective: 2
AACSB: Analytical skills

13) The flexible-budget variance is:
A) $4,000 favorable
B) $28,000 unfavorable
C) $32,800 unfavorable
D) $4,800 favorable
Answer: A
Explanation: A) ($160 - $164) × 1,000 = $4,000 F
Diff: 2
Terms: flexible-budget variance
Objective: 2
AACSB: Analytical skills
14) The sales-volume variance is:
A) $4,000 favorable
B) $28,000 unfavorable
C) $32,800 unfavorable
D) $4,800 favorable
Answer: C
Explanation: C) (1,000 - 1,200) × $164 = $32,800 U
Diff: 2
Terms: sales-volume variance
Objective: 2
AACSB: Analytical skills

15) Bebee Corporation currently produces cardboard boxes in an automated process. Expected production per month is 40,000 units, direct-material costs are $0.60 per unit, and manufacturing overhead costs are $18,000 per month. Manufacturing overhead is all fixed costs. What is the flexible budget for 20,000 and 40,000 units, respectively?
A) $21,000; $33,000
B) $21,000; $42,000
C) $30,000; $42,000
D) None of these answers are correct.
Answer: C
Explanation: C) 20,000 units 40,000 units
<table>
<thead>
<tr>
<th></th>
<th>20,000 units</th>
<th>40,000 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials ($0.60)</td>
<td>$12,000</td>
<td>$24,000</td>
</tr>
<tr>
<td>Machinery</td>
<td>18,000</td>
<td>18,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$30,000</strong></td>
<td><strong>$42,000</strong></td>
</tr>
</tbody>
</table>
Diff: 2
Terms: flexible budget
Objective: 2
AACSB: Analytical skills

Answer the following questions using the information below:

Brennen Incorporated planned to use $24 of material per unit but actually used $25 of material per unit, and planned to make 2,000 units but actually made 2,400 units.

16) The flexible-budget amount is:
A) $48,000
B) $50,000
C) $57,600
D) $60,000
Answer: C
Explanation: C) 2,400 units × $24 = $57,600
Diff: 2
Terms: flexible budget
Objective: 2
AACSB: Analytical skills
17) The flexible-budget variance is:
A) $9,600 favorable
B) $2,400 unfavorable
C) $10,000 unfavorable
D) $12,000 favorable
Answer: B
Explanation: B) ($25 - $24) \times 2,400 = $2,400 \text{ U}
Diff: 2
Terms: flexible-budget variance
Objective: 2
AACSB: Analytical skills

18) The sales-volume variance is:
A) $9,600 favorable
B) $2,400 unfavorable
C) $10,000 unfavorable
D) $12,000 favorable
Answer: A
Explanation: A) (2,400 - 2,000) \times $24 = $9,600 \text{ F}
Diff: 2
Terms: sales-volume variance
Objective: 2
AACSB: Analytical skills

Answer the following questions using the information below:

Melville Incorporated planned to use $37.50 of material per unit but actually used $36.75 of material per unit, and planned to make 1,800 units but actually made 1,600 units.

19) The flexible-budget amount is:
A) $60,000
B) $67,500
C) $59,200
D) $1,200
Answer: A
Explanation: A) 1,600 units \times $37.50 = $60,000
Diff: 2
Terms: flexible budget
Objective: 2
AACSB: Analytical skills
20) The flexible-budget variance is:
A) $7,500 favorable
B) $7,500 unfavorable
C) $1,200 unfavorable
D) $1,200 favorable
Answer: D
Explanation: D) $(36.75 - $37.50) \times 1,600 = $1,200 \text{ F}
Diff: 2
Terms: flexible-budget variance
Objective: 2
AACSB: Analytical skills

21) The sales-volume variance is:
A) $7,500 favorable
B) $7,500 unfavorable
C) $1,200 unfavorable
D) $1,200 favorable
Answer: B
Explanation: B) (1,600 - 1,800) \times $37.50 = $7,500 \text{ U}
Diff: 2
Terms: sales-volume variance
Objective: 2
AACSB: Analytical skills

22) Hemberger Corporation currently produces baseball caps in an automated process. Expected production per month is 20,000 units, direct material costs are $3.00 per unit, and manufacturing overhead costs are $46,000 per month. Manufacturing overhead is entirely fixed costs. What is the flexible budget for 10,000 and 20,000 units, respectively?
A) $53,000; $83,000
B) $53,000; $106,000
C) $76,000; $106,000
D) None of these answers are correct.
Answer: C
Explanation: C) 
<table>
<thead>
<tr>
<th></th>
<th>10,000 units</th>
<th>20,000 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials ($3.00)</td>
<td>$30,000</td>
<td>$60,000</td>
</tr>
<tr>
<td>Machinery</td>
<td>46,000</td>
<td>46,000</td>
</tr>
<tr>
<td></td>
<td>$76,000</td>
<td>$106,000</td>
</tr>
</tbody>
</table>
Diff: 2
Terms: flexible budget
Objective: 2
AACSB: Analytical skills
Answer the following questions using the information below:

The actual information pertains to the month of September. As part of the budgeting process, Kriger Fencing Company developed the following static budget for September. Kriger is in the process of preparing the flexible budget and understanding the results.

<table>
<thead>
<tr>
<th>Actual Results</th>
<th>Flexible Budget</th>
<th>Static Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales volume (in units)</td>
<td>10,000</td>
<td>12,500</td>
</tr>
<tr>
<td>Sales revenues</td>
<td>$500,000</td>
<td>$</td>
</tr>
<tr>
<td>Variable costs</td>
<td>256,000</td>
<td>$</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>244,000</td>
<td>$</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>229,000</td>
<td>$</td>
</tr>
<tr>
<td>Operating profit</td>
<td>$15,000</td>
<td>$</td>
</tr>
</tbody>
</table>

23) The flexible budget will report ________ for variable costs.
A) $256,000
B) $300,000
C) $240,000
D) $320,000
Answer: C
Explanation: C) 10,000 units \times $300,000/12,500 = $240,000
Diff: 2
Terms: flexible budget
Objective: 2
AACSB: Analytical skills

24) The flexible budget will report ________ for the fixed costs.
A) $229,000
B) $225,000
C) $180,000
D) $286,250
Answer: B
Explanation: B) $225,000, given in the static budget
Diff: 2
Terms: flexible budget
Objective: 2
AACSB: Analytical skills
25) The flexible-budget variance for variable costs is:
A) $16,000 unfavorable
B) $60,000 unfavorable
C) $16,000 favorable
D) $60,000 favorable
Answer: A
Explanation: A) $256,000 - (10,000 × $300,000/12,500) = $16,000 U
Diff: 2
Terms: flexible-budget variance
Objective: 2
AACSB: Analytical skills

26) The only difference between the static budget and flexible budget is that the static budget is prepared using planned output.
Answer: TRUE
Diff: 2
Terms: static budget, flexible budget
Objective: 2
AACSB: Reflective thinking

27) The static-budget variance can be subdivided into the flexible-budget variance and the sales-volume variance.
Answer: TRUE
Diff: 2
Terms: static-budget variance, sales-volume variance, flexible-budget variance
Objective: 2
AACSB: Reflective thinking

28) The flexible-budget variance may be the result of inaccurate forecasting of units sold.
Answer: FALSE
Explanation: The sales-volume variance is the result of inaccurate forecasting of units sold.
Diff: 3
Terms: flexible-budget variance
Objective: 2
AACSB: Reflective thinking

29) Decreasing demand for a product may create a favorable sales-volume variance.
Answer: FALSE
Explanation: Decreasing demand for a product may create an unfavorable sales-volume variance.
Diff: 2
Terms: sales-volume variance
Objective: 2
AACSB: Reflective thinking
30) An unfavorable variance is conclusive evidence of poor performance.
Answer: FALSE
Explanation: An unfavorable variance suggests further investigation, not conclusive evidence of poor performance.
Diff: 2
Terms: unfavorable variance
Objective: 2
AACSB: Reflective thinking

31) A company would NOT need to use a flexible budget if it had perfect foresight about actual output units.
Answer: TRUE
Diff: 2
Terms: flexible budget
Objective: 2
AACSB: Reflective thinking

32) The flexible-budget variance for direct-cost inputs is subdivided into two detailed variances, the efficiency variance and the price variance.
Answer: TRUE
Diff: 1
Terms: flexible-budget variance
Objective: 2
AACSB: Reflective thinking
33) The president of the company, Gregory Peters, has come to you for help. Use the following data to prepare a flexible budget for possible sales/production levels of 10,000, 11,000, and 12,000 units. Show the contribution margin at each activity level.

Sales price $24 per unit
Variable costs:
- Manufacturing $12 per unit
- Administrative $3 per unit
- Selling $1 per unit
Fixed costs:
- Manufacturing $60,000
- Administrative $20,000

Answer:

<table>
<thead>
<tr>
<th>Units</th>
<th>10,000</th>
<th>11,000</th>
<th>12,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$240,000</td>
<td>$264,000</td>
<td>$288,000</td>
</tr>
<tr>
<td>Variable costs:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>120,000</td>
<td>132,000</td>
<td>144,000</td>
</tr>
<tr>
<td>Administrative</td>
<td>30,000</td>
<td>33,000</td>
<td>36,000</td>
</tr>
<tr>
<td>Selling</td>
<td>10,000</td>
<td>11,000</td>
<td>12,000</td>
</tr>
<tr>
<td>Total variable costs</td>
<td>160,000</td>
<td>176,000</td>
<td>192,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>80,000</td>
<td>88,000</td>
<td>96,000</td>
</tr>
<tr>
<td>Fixed costs:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>60,000</td>
<td>60,000</td>
<td>60,000</td>
</tr>
<tr>
<td>Administrative</td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Operating income/(loss)</td>
<td>$ -0-</td>
<td>$ 8,000</td>
<td>$ 16,000</td>
</tr>
</tbody>
</table>

Diff: 2
Terms: flexible budget
Objective: 2
AACSB: Analytical skills
34) Nicholas Company manufacturers TVs. Some of the company's data was misplaced. Use the
following information to replace the lost data:

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Actual Results</th>
<th>Flexible Variances</th>
<th>Flexible Budget</th>
<th>Sales-Volume Variances</th>
<th>Static Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units Sold</td>
<td>112,500</td>
<td>112,500</td>
<td>103,125</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenues</td>
<td>$42,080</td>
<td>$1,000 F</td>
<td>(A) $1,400 U</td>
<td>(B) $1,400 U</td>
<td></td>
</tr>
<tr>
<td>Variable Costs</td>
<td>(C) $200 U</td>
<td>$15,860</td>
<td>$2,340 F</td>
<td>$18,200</td>
<td></td>
</tr>
<tr>
<td>Fixed Costs</td>
<td>$8,280</td>
<td>$860 F</td>
<td>$9,140</td>
<td>$9,140</td>
<td></td>
</tr>
<tr>
<td>Operating Income</td>
<td>$17,740</td>
<td>(D) $16,080</td>
<td>(E) $15,140</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Required:**

a. What are the respective flexible-budget revenues (A)?
b. What are the static-budget revenues (B)?
c. What are the actual variable costs (C)?
d. What is the total flexible-budget variance (D)?
e. What is the total sales-volume variance (E)?
f. What is the total static-budget variance?

**Answer:**

a. $42,080 - $1,000 = $41,080

b. $41,080 + $1,400 = $42,480

c. $15,860 + $200 = $16,060

d. $17,740 - $16,080 = $1,660 favorable

e. $2,340 favorable + $1,400 unfavorable = $940 favorable

f. $17,740 - $15,140 = $2,600 favorable

**Diff: 2**

**Terms:** flexible/static budget; static-budget/flexible-budget/sales-volume variance

**Objective:** 2

**AACSB:** Analytical skills
Objective 7.3

Answer the following questions using the information below:

The actual information pertains to the month of September. As part of the budgeting process, Kriger Fencing Company developed the following static budget for September. Kriger is in the process of preparing the flexible budget and understanding the results.

<table>
<thead>
<tr>
<th></th>
<th>Actual Results</th>
<th>Flexible Budget</th>
<th>Static Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales volume (in units)</td>
<td>10,000</td>
<td>12,500</td>
<td></td>
</tr>
<tr>
<td>Sales revenues</td>
<td>$500,000</td>
<td>$</td>
<td>$625,000</td>
</tr>
<tr>
<td>Variable costs</td>
<td>256,000</td>
<td>$</td>
<td>300,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>244,000</td>
<td>$</td>
<td>325,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>229,000</td>
<td>$</td>
<td>225,000</td>
</tr>
<tr>
<td>Operating profit</td>
<td>$15,000</td>
<td>$</td>
<td>$100,000</td>
</tr>
</tbody>
</table>

1) The primary reason for low operating profits was:
   A) the variable-cost variance
   B) increased fixed costs
   C) a poor management accounting system
   D) lower sales volume than planned
   Answer: D
   Diff: 3
   Terms: sales-volume variance
   Objective: 3
   AACSB: Analytical skills
Answer the following questions using the information below:

The actual information pertains to the third quarter. As part of the budgeting process, the Duck Decoy Department of Wooden Figurines Incorporated had developed the following static budget for the third quarter. Duck Decoy is in the process of preparing the flexible budget and understanding the results.

<table>
<thead>
<tr>
<th></th>
<th>Actual Results</th>
<th>Flexible Budget</th>
<th>Static Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales volume (in units)</td>
<td>13,000</td>
<td></td>
<td>12,000</td>
</tr>
<tr>
<td>Sales revenues</td>
<td>$257,500</td>
<td>$</td>
<td>$250,000</td>
</tr>
<tr>
<td>Variable costs</td>
<td>154,000</td>
<td>$</td>
<td>$175,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>103,500</td>
<td>$</td>
<td>75,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>$50,500</td>
<td>$</td>
<td>$49,500</td>
</tr>
<tr>
<td>Operating profit</td>
<td>$53,000</td>
<td>$</td>
<td>$25,500</td>
</tr>
</tbody>
</table>

2) The flexible budget will report ________ for variable costs.
A) $154,000
B) $189,583
C) $175,000
D) $13,583
Answer: B
Explanation: B) 13,000 units × $175,000/12,000 = $189,583
Diff: 2
Terms: flexible budget
Objective: 3
AACSB: Analytical skills

3) The flexible budget will report ________ for the fixed costs.
A) $50,500
B) $49,500 Favorable
C) $49,500
D) $1,000 Unfavorable
Answer: C
Explanation: C) $49,500, given in the static budget
Diff: 2
Terms: flexible budget
Objective: 3
AACSB: Analytical skills
4) The flexible-budget variance for variable costs is:
A) $21,000 favorable
B) $13,583 unfavorable
C) $35,583 unfavorable
D) $35,583 favorable
Answer: D
Explanation: D) \[ (13,000 \times \frac{175,000}{12,000}) - 154,000 = 35,583 \text{ F} \]
Diff: 2
Terms: flexible-budget variance
Objective: 3
AACSB: Analytical skills

5) The primary reason for high actual operating profits was:
A) the variable-cost variance
B) increased fixed costs
C) higher sales volume than planned
D) lower sales volume than planned
Answer: A
Diff: 3
Terms: sales-volume variance
Objective: 3
AACSB: Analytical skills
Manash Company manufactures tires. Some of the company's data was misplaced. Use the following information to replace the lost data:

<table>
<thead>
<tr>
<th></th>
<th>Actual Results</th>
<th>Flexible Budget Variances</th>
<th>Flexible Budget</th>
<th>Sales-Volume Variances</th>
<th>Static Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units sold</td>
<td>450,000</td>
<td>450,000</td>
<td></td>
<td></td>
<td>412,500</td>
</tr>
<tr>
<td>Revenues</td>
<td>$168,320</td>
<td>$4,000 F</td>
<td>(A)</td>
<td>$5,600 U</td>
<td>(B)</td>
</tr>
<tr>
<td>Variable costs</td>
<td>(C)</td>
<td>$800 U</td>
<td>$63,440</td>
<td>$9,360 F</td>
<td>$72,800</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>$33,120</td>
<td>$3,440 F</td>
<td>$36,560</td>
<td>0</td>
<td>$36,560</td>
</tr>
<tr>
<td>Operating income</td>
<td>$70,960</td>
<td>(D)</td>
<td>$64,320</td>
<td>(E)</td>
<td>$60,560</td>
</tr>
</tbody>
</table>

6) What amounts are reported for revenues in the flexible-budget (A) and the static-budget (B), respectively?
   A) $164,320; $158,720
   B) $164,320; $169,920
   C) $169,920; $177,920
   D) $169,920; $166,720
   Answer: B
   Diff: 2
   Terms: flexible budget
   Objective: 3
   AACSB: Analytical skills

7) What are the actual variable costs (C)?
   A) $72,800
   B) $64,240
   C) $62,640
   D) $54,080
   Answer: B
   Diff: 2
   Terms: flexible budget
   Objective: 3
   AACSB: Analytical skills

8) What is the total flexible-budget variance (D)?
   A) $240 unfavorable
   B) $0
   C) $1,360 favorable
   D) $6,640 favorable
   Answer: D
   Diff: 2
   Terms: flexible-budget variance
   Objective: 3
   AACSB: Analytical skills
9) What is the total sales-volume variance (E)?
A) $14,960 unfavorable
B) $5,600 unfavorable
C) $3,760 favorable
D) $14,960 favorable
Answer:  C
Diff: 2
Terms:  sales-volume variance
Objective:  3
AACSB:  Analytical skills

10) What is the total static-budget variance?
A) $10,400 favorable
B) $6,640 favorable
C) $3,760 unfavorable
D) $3,760 favorable
Answer:  A
Diff: 2
Terms:  static-budget variance
Objective:  3
AACSB:  Analytical skills

11) The flexible-budget variance pertaining to revenues is often called a selling-price variance.
Answer:  TRUE
Diff: 1
Terms:  flexible-budget variance
Objective:  3
AACSB:  Reflective thinking

12) Cost control is the focus of the sales-volume variance.
Answer:  FALSE
Explanation:  The sales-volume variance is not a measure of cost, but rather a measure of actual output units differing from budgeted output units.
Diff: 2
Terms:  sales-volume variance
Objective:  3
AACSB:  Reflective thinking
13) Bach Table Company manufactures tables for schools. The 2011 operating budget is based on sales of 40,000 units at $50 per table. Operating income is anticipated to be $120,000. Budgeted variable costs are $32 per unit, while fixed costs total $600,000.

Actual income for 2011 was a surprising $354,000 on actual sales of 42,000 units at $52 each. Actual variable costs were $30 per unit and fixed costs totaled $570,000.

**Required:**
Prepare a variance analysis report with both flexible-budget and sales-volume variances.

**Answer:**

**Bach Table Company**  
**Variance Analysis**

<table>
<thead>
<tr>
<th></th>
<th>Actual Results</th>
<th>Flexible Variances</th>
<th>Flexible Budget Variances</th>
<th>Static Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units sold</td>
<td>42,000</td>
<td>42,000</td>
<td>40,000</td>
<td></td>
</tr>
<tr>
<td>Sales</td>
<td>$2,184,000</td>
<td>$84,000</td>
<td>$2,100,000</td>
<td></td>
</tr>
<tr>
<td>Variable costs</td>
<td>1,260,000</td>
<td>$84,000</td>
<td>1,344,000</td>
<td>64,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$924,000</td>
<td>$168,000</td>
<td>$756,000</td>
<td>64,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>570,000</td>
<td>30,000</td>
<td>600,000</td>
<td>600,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$354,000</td>
<td>$198,000</td>
<td>$156,000</td>
<td>$120,000</td>
</tr>
</tbody>
</table>

**Total flexible-budget variance = $198,000 favorable.**

**Total sales-volume variance = $36,000 favorable.**

**Diff: 2**

**Terms:** static budget, flexible-budget variance, sales-volume variance

**Objective:** 2, 3

**AACSB:** Analytical skills

**Objective 7.4**

1) The flexible-budget variance for direct cost inputs can be further subdivided into a:
   A) static-budget variance and a sales-volume variance
   B) sales-volume variance and an efficiency variance
   C) price variance and an efficiency variance
   D) static-budget variance and a price variance

**Answer:** C

**Diff: 1**

**Terms:** flexible-budget variance

**Objective:** 4

**AACSB:** Analytical skills
2) Budgeted input quantity information may be obtained from:
A) actual input quantities used last period
B) standards developed by your company
C) data from other companies that have similar processes
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: standard input
Objective: 4
AACSB: Reflective thinking

3) When actual input data from past periods is used to develop a budget:
A) past inefficiencies are excluded
B) expected future changes are incorporated
C) information is available at a low cost
D) audited financial information must be used
Answer: C
Diff: 2
Terms: standard cost
Objective: 4
AACSB: Reflective thinking

4) When standards are used to develop a budget:
A) past inefficiencies are excluded
B) benchmarking must also be used
C) information is available at a low cost
D) flexible-budget amounts are difficult to determine
Answer: A
Diff: 2
Terms: standard cost
Objective: 4
AACSB: Reflective thinking

5) The term budget indicates:
A) that standards have been used to develop the budget
B) that actual input data from past periods have been used to develop the budget
C) that engineering studies have been used to develop the budget
D) planned amounts for a future accounting period
Answer: D
Diff: 1
Terms: static budget
Objective: 4
AACSB: Reflective thinking
6) A standard input:
A) is a carefully determined price, cost, or quantity
B) is usually expressed on a per unit basis
C) may be developed using engineering studies
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: standard input
Objective: 4
AACSB: Reflective thinking

7) Ideal standards:
A) assume peak operating conditions
B) allow for normal machine breakdowns
C) greatly improve employee motivation and performance
D) All of these answers are correct.
Answer: A
Diff: 1
Terms: standard cost
Objective: 4
AACSB: Reflective thinking

Answer the following questions using the information below:

Diana Industries, Inc. (DII), developed standard costs for direct material and direct labor. In 2010, DII estimated the following standard costs for one of their major products, the 10-gallon plastic container.

<table>
<thead>
<tr>
<th></th>
<th>Budgeted quantity</th>
<th>Budgeted price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>0.10 pounds</td>
<td>$30 per pound</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.05 hours</td>
<td>$15 per hour</td>
</tr>
</tbody>
</table>

During June, DII produced and sold 10,000 containers using 980 pounds of direct materials at an average cost per pound of $32 and 500 direct manufacturing labor-hours at an average wage of $15.25 per hour.

8) June's direct material efficiency variance is:
A) $1,860 unfavorable
B) $600 favorable
C) $1,360 favorable
D) None of these answers are correct.
Answer: B
Explanation: B) $30 \times (980 - 1,000) = $600 F
Diff: 2
Terms: efficiency variance
Objective: 4
AACSB: Analytical skills
9) Managers generally have more control over price variances than efficiency variances.
Answer: FALSE
Explanation: Managers generally have more control over efficiency variances because efficiency variances are primarily affected by internal factors, whereas price changes may be influenced by market factors.
Diff: 3
Terms: efficiency variance, price variance
Objective: 4
AACSB: Reflective thinking

10) To prepare budgets based on actual data from past periods is preferred since past inefficiencies are EXCLUDED.
Answer: FALSE
Explanation: A deficiency of using budgeted input quantity information based on actual quantity data from past periods is that past inefficiencies are included.
Diff: 2
Terms: static budget
Objective: 4
AACSB: Reflective thinking

11) All budgets are based on standard costs.
Answer: FALSE
Explanation: Budgets may be based on standard costs, actual amounts from last year, or data from other companies.
Diff: 2
Terms: standard cost
Objective: 4
AACSB: Reflective thinking

12) A standard is attainable through efficient operations but allows for normal disruptions such as machine breakdowns and defective production.
Answer: TRUE
Diff: 3
Terms: standard cost
Objective: 4
AACSB: Reflective thinking

13) One advantage of using standard times to develop a budget is they are simple to compile, are based solely on the past actual history, and do NOT require expected future changes to be taken into account.
Answer: FALSE
Explanation: An advantage of using standard times is they aim to take into account changes expected to occur in the budget period.
Diff: 3
Terms: standard
Objective: 4
AACSB: Reflective thinking
14) The textbook discusses three levels of variances, Level 0, Level 1, Level 2, and Level 3. Briefly explain the meaning of each of those levels and provide an example of a variance at each of those levels. Answer: A Level 0 variance is simply the difference between actual operating income and planned operating income in the static budget.

A Level 1 variance would be any of the differences between the static budget and the actual results that make up operating income. Examples of such differences could include the following items:

- Units sold (Static budget - actual)
- Revenues (Static budget - actual)
- Material costs (Static budget - actual)
- Direct manufacturing labor (Static budget - actual)
- Variable manufacturing overhead (Static budget - actual)
- Contribution margin (Static budget - actual)
- Fixed costs (Static budget - actual)

A Level 2 variance subdivides the level 0 variance (which is the total of the Level 1 variances) into a sales volume variance and a flexible-budget variance. The sales volume variance is the difference between the flexible budget amount and the corresponding static budget amount. The flexible budget variance is an actual result and the corresponding flexible budget amount based on the actual output level in the budget period. Specific examples of Level 2 variances could include any of the items shown in the list of Level 1 variances.

A Level 3 variance would include price variances that reflect the difference between the actual input price and a budgeted input price, such as the direct material price variance, the direct labor rate variance, and the variable overhead rate variance. Level 3 variances would also include efficiency variances that reflect the difference between an actual input quantity and a budgeted input quantity. Examples would include material quantity variances, labor efficiency variances, and variable overhead efficiency variances.

Diff: 3
Terms: variance
Objective: 2, 3, 4
AACSB: Reflective thinking

Objective 7.5

1) A favorable price variance for direct materials indicates that:
A) a lower price than planned was paid for materials
B) a higher price than planned was paid for materials
C) less material was used during production than planned for actual output
D) more material was used during production than planned for actual output
Answer: A
Diff: 2
Terms: price variance
Objective: 5
AACSB: Reflective thinking
2) A favorable efficiency variance for direct manufacturing labor indicates that:
A) a lower wage rate than planned was paid for direct labor
B) a higher wage rate than planned was paid for direct labor
C) less direct manufacturing labor-hours were used during production than planned for actual output
D) more direct manufacturing labor-hours were used during production than planned for actual output
Answer: C
Diff: 2
Terms: efficiency variance
Objective: 5
AACSB: Reflective thinking

3) An unfavorable price variance for direct materials might indicate:
A) that the purchasing manager purchased in smaller quantities due to a change to just-in-time inventory methods
B) congestion due to scheduling problems
C) that the purchasing manager skillfully negotiated a better purchase price
D) that the market had an unexpected oversupply of those materials
Answer: A
Diff: 3
Terms: price variance
Objective: 5
AACSB: Reflective thinking

4) A favorable efficiency variance for direct materials might indicate:
A) that lower-quality materials were purchased
B) an overskilled workforce
C) poor design of products or processes
D) a lower-priced supplier was used
Answer: B
Diff: 3
Terms: efficiency variance
Objective: 5
AACSB: Analytical skills

5) A favorable price variance for direct manufacturing labor might indicate that:
A) employees were paid more than planned
B) budgeted price standards are too tight
C) underskilled employees are being hired
D) an efficient labor force
Answer: C
Diff: 3
Terms: price variance
Objective: 5
AACSB: Analytical skills
6) An unfavorable efficiency variance for direct manufacturing labor might indicate that:
A) work was efficiently scheduled
B) machines were not properly maintained
C) budgeted time standards are too lax
D) more higher-skilled workers were scheduled than planned
Answer: B
Diff: 3
Terms: efficiency variance
Objective: 5
AACSB: Ethical reasoning

Answer the following questions using the information below:

Diana Industries, Inc. (DII), developed standard costs for direct material and direct labor. In 2010, DII estimated the following standard costs for one of their major products, the 10-gallon plastic container.

<table>
<thead>
<tr>
<th></th>
<th>Budgeted quantity</th>
<th>Budgeted price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>0.10 pounds</td>
<td>$30 per pound</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.05 hours</td>
<td>$15 per hour</td>
</tr>
</tbody>
</table>

During June, DII produced and sold 10,000 containers using 980 pounds of direct materials at an average cost per pound of $32 and 500 direct manufacturing labor-hours at an average wage of $15.25 per hour.

7) June's direct material flexible-budget variance is:
A) $1,860 unfavorable
B) $600 favorable
C) $1,360 unfavorable
D) None of these answers are correct.
Answer: C
Explanation: C) (980 × $32) - (10,000 × 0.10 × $30) = $1,360 U
Diff: 2
Terms: flexible-budget variance
Objective: 5
AACSB: Analytical skills

8) June's direct material price variance is:
A) $1,960 unfavorable
B) $600 favorable
C) $1,360 favorable
D) None of these answers are correct.
Answer: A
Explanation: A) 980 × ($32 - $30) = $1,960 U
Diff: 2
Terms: price variance
Objective: 5
AACSB: Analytical skills
9) June's direct manufacturing labor price variance is:
A) $125 unfavorable
B) $125 favorable
C) $7,623.50 unfavorable
D) None of these answers are correct.
Answer: A
Explanation: A) 500 dlh × ($15.25 - $15.00) = $125 U
Diff: 2
Terms: price variance
Objective: 5
AACSB: Analytical skills

10) June's direct manufacturing labor efficiency variance is:
A) $125 unfavorable
B) $125 favorable
C) $7,623.50 unfavorable
D) None of these answers are correct.
Answer: D
Explanation: D) 500 dlh - (10,000 × 0.05)] × $15 = Zero
Diff: 2
Terms: efficiency variance
Objective: 5
AACSB: Analytical skills

Answer the following questions using the information below:

Sawyer Industries, Inc. (SII), developed standard costs for direct material and direct labor. In 2011, SII estimated the following standard costs for one of their major products, the 30-gallon heavy-duty plastic container.

<table>
<thead>
<tr>
<th></th>
<th>Budgeted quantity</th>
<th>Budgeted price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>0.20 pounds</td>
<td>$25 per pound</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.10 hours</td>
<td>$15 per hour</td>
</tr>
</tbody>
</table>

During July, SII produced and sold 5,000 containers using 1,100 pounds of direct materials at an average cost per pound of $24 and 525 direct manufacturing labor hours at an average wage of $14.75 per hour.

11) July's direct material flexible-budget variance is:
A) $1,400 unfavorable
B) $21,100 favorable
C) $2,500 unfavorable
D) None of these answers are correct.
Answer: A
Explanation: A) (1,100 × $24) - (5,000 × 0.20 × $25) = $1,400 U
Diff: 2
Terms: flexible-budget variance
Objective: 5
AACSB: Analytical skills
12) July's direct material price variance is:
A) $1,400 favorable
B) $1,100 favorable
C) $2,500 unfavorable
D) None of these answers are correct.
Answer: B
Explanation: B) $1,100 × ($24 - $25) = $1,100 F
Diff: 2
Terms: price variance
Objective: 5
AACSB: Analytical skills

13) July's direct material efficiency variance is:
A) $1,400 unfavorable
B) $1,100 favorable
C) $2,500 unfavorable
D) None of these answers are correct.
Answer: C
Explanation: C) $25 × [1,100 - (5,000 × 0.20)] = $2,500 U
Diff: 2
Terms: efficiency variance
Objective: 5
AACSB: Analytical skills

14) July's direct manufacturing labor flexible-budget variance is:
A) $375.00 unfavorable
B) $131.25 favorable
C) $243.75 unfavorable
D) None of these answers are correct.
Answer: C
Explanation: C) (525 × $14.75) - (5,000 × 0.10 × $15) = $243.75 U
Diff: 2
Terms: flexible-budget variance
Objective: 5
AACSB: Analytical skills

15) July's direct manufacturing labor price variance is:
A) $375.00 unfavorable
B) $131.25 favorable
C) $243.75 favorable
D) None of these answers are correct.
Answer: B
Explanation: B) 525 dlh × ($14.75 - $15.00) = $131.25 F
Diff: 2
Terms: price variance
Objective: 5
AACSB: Analytical skills
16) July's direct manufacturing labor efficiency variance is:
A) $375.00 unfavorable
B) $131.25 favorable
C) $243.75 favorable
D) None of these answers are correct.
Answer: A
Explanation: A) \[525 \text{ dlh} - (5,000 \times 0.10)\] \times $15 = $375 U
Diff: 2
Terms: efficiency variance
Objective: 5
AACSB: Analytical skills

Answer the following questions using the information below:

Apple Valley Orchards, Inc. (AVO), developed standard costs for direct material and direct labor. In 2011, AVO estimated the following standard costs for one of their most well loved products, the AVO classic Grandma's large apple pie which had a brown sugar coating on the top of the crust as well as including cranberry and mince ingredients in addition to the apples.

<table>
<thead>
<tr>
<th></th>
<th>Budgeted quantity</th>
<th>Budgeted price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>1.5 pounds</td>
<td>$7.25 per pound</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.25 hours</td>
<td>$14.00 per hour</td>
</tr>
</tbody>
</table>

During September, AVO produced and sold 1,200 pies using 1,875 pounds of direct materials at an average cost per pound of $7.00 and 280 direct labor hours at an average wage of $14.25 per hour.

17) September's direct material flexible-budget variance is:
A) $100.00 unfavorable
B) $100.00 favorable
C) $75.00 unfavorable
D) None of these answers are correct.
Answer: C
Explanation: C) \((1,875 \times $7.00) - (1,200 \times 1.5 \times $7.25) = $75.00 U\)
Diff: 2
Terms: flexible-budget variance
Objective: 5
AACSB: Analytical skills

18) September's direct material price variance is:
A) $468.75 favorable
B) $468.75 unfavorable
C) $75.00 unfavorable
D) None of these answers are correct.
Answer: A
Explanation: A) \(1,875 \times ($7.00 - $7.25) = $468.75\) F
Diff: 2
Terms: price variance
Objective: 5
AACSB: Analytical skills
19) September's direct material efficiency variance is:
A) $468.75 favorable  
B) $468.75 unfavorable  
C) $543.75 favorable  
D) $543.75 unfavorable  
Answer: D  
Explanation: D) $7.25 \times [1,875 - (1,200 \times 1.5)] = $543.75 U  
Diff: 2  
Terms: efficiency variance  
Objective: 5  
AACSB: Analytical skills

20) September's direct labor flexible-budget variance is:
A) $210.00 favorable  
B) $210.00 unfavorable  
C) $280.00 favorable  
D) $280.00 unfavorable  
Answer: A  
Explanation: A) (280 \times $14.25) - (1,200 \times 0.25 \times $14) = $210.00 F  
Diff: 2  
Terms: flexible-budget variance  
Objective: 5  
AACSB: Analytical skills

21) September's direct labor price variance is:
A) $210.00 unfavorable  
B) $210.00 favorable  
C) $70.00 unfavorable  
D) $70.00 favorable  
Answer: C  
Explanation: C) 280 dlh \times ($14.25 - $14.00) = $70 U  
Diff: 2  
Terms: price variance  
Objective: 5  
AACSB: Analytical skills

22) September's direct labor efficiency variance is:
A) $280.00 favorable  
B) $280.00 unfavorable  
C) $210.00 favorable  
D) $210.00 unfavorable  
Answer: A  
Explanation: A) [280 dlh - (1,200 \times 0.25)] \times $14 = $280 F  
Diff: 2  
Terms: efficiency variance  
Objective: 5  
AACSB: Analytical skills
Answer the following questions using the information below:

These questions refer to flexible-budget variance formulas with the following descriptions for the variables: A = Actual; B = Budgeted; P = Price; Q = Quantity.

23) The best label for the formula (AQ - BQ) BP is the:
A) efficiency variance  
B) price variance  
C) total flexible-budget variance  
D) spending variance  
Answer: A  
Diff: 2  
Terms: efficiency variance  
Objective: 5  
AACSB: Analytical skills

24) The best label for the formula (AP - BP) AQ is the:
A) efficiency variance  
B) price variance  
C) total flexible-budget variance  
D) spending variance  
Answer: B  
Diff: 2  
Terms: price variance  
Objective: 5  
AACSB: Analytical skills

25) The best label for the formula [(AP)(AQ) - (BP)(AQ)] is the:
A) efficiency variance  
B) price variance  
C) total flexible-budget variance  
D) spending variance  
Answer: B  
Diff: 2  
Terms: price variance  
Objective: 5  
AACSB: Analytical skills

26) The best label for the formula [(AP)(AQ) - (BP)(BQ)] is the:
A) efficiency variance  
B) price variance  
C) total flexible-budget variance  
D) spending variance  
Answer: C  
Diff: 2  
Terms: flexible-budget variance  
Objective: 5  
AACSB: Analytical skills
Berman's Camera Shop has prepared the following flexible budget for September and is in the process of interpreting the variances. F denotes a favorable variance and U denotes an unfavorable variance.

<table>
<thead>
<tr>
<th>Flexible Budget</th>
<th>Variances</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Price</td>
</tr>
<tr>
<td>Material A</td>
<td>$40,000</td>
</tr>
<tr>
<td>Material B</td>
<td>60,000</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>80,000</td>
</tr>
</tbody>
</table>

27) The most likely explanation of the above variances for Material A is that:
A) a lower price than expected was paid for Material A
B) higher-quality raw materials were used than were planned
C) the company used a higher-priced supplier
D) Material A used during September was $2,000 less than expected
Answer: A
Diff: 3
Terms: price variance
Objective: 5
AACSB: Analytical skills

28) The actual amount spent for Material B was:
A) $58,000
B) $59,000
C) $60,000
D) $61,000
Answer: B
Explanation: B) $60,000 + $500 U - $1,500 F = $59,000
Diff: 2
Terms: price variance
Objective: 5
AACSB: Analytical skills

29) The actual amount spent for direct manufacturing labor was:
A) $80,000
B) $83,000
C) $82,000
D) $78,000
Answer: D
Explanation: D) $80,000 + $500 U - $2,500 F = $78,000
Diff: 2
Terms: price variance
Objective: 5
AACSB: Analytical skills
30) The most likely explanation of the above direct manufacturing labor variances is that:
A) the average wage rate paid to employees was less than expected
B) employees did not work as efficiently as expected to accomplish the job
C) the company may have assigned more experienced employees this month than originally planned
D) management may have a problem with budget slack and might be using lax standards for both labor-wage rates and expected efficiency
Answer: C
Diff: 3
Terms: efficiency variance
Objective: 5
AACSB: Analytical skills

Answer the following questions using the information below:

Hector's Camera Shop has prepared the following flexible budget for September and is in the process of interpreting the variances. F denotes a favorable variance and U denotes an unfavorable variance.

<table>
<thead>
<tr>
<th>Material</th>
<th>Flexible Budget</th>
<th>Variances</th>
<th>Price</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$20,000</td>
<td></td>
<td>$1,000U</td>
<td>$1,200F</td>
</tr>
<tr>
<td>B</td>
<td>30,000</td>
<td></td>
<td>500F</td>
<td>800U</td>
</tr>
<tr>
<td>C</td>
<td>40,000</td>
<td></td>
<td>1,400U</td>
<td>1,000F</td>
</tr>
</tbody>
</table>

31) The actual amount spent for Material A was:
A) $18,800
B) $20,200
C) $19,800
D) $21,000
Answer: C
Explanation: C) $20,000 + 1,000 U - $1,200 F = $19,800
Diff: 2
Terms: price variance
Objective: 5
AACSB: Analytical skills

32) The actual amount spent for Material B was:
A) $29,700
B) $30,800
C) $30,500
D) $30,300
Answer: D
Explanation: D) $30,000 - $500 F + $800 U = $30,300
Diff: 2
Terms: price variance
Objective: 5
AACSB: Analytical skills
33) The explanation that lower-quality materials were purchased is most likely for:
A) Material A
B) Material B
C) Material C
D) both Material A and C
Answer: B
Diff: 3
Terms: efficiency variance
Objective: 5
AACSB: Analytical skills

34) The presumed cause of a material price variance will determine how a company responds.
Answer: TRUE
Diff: 1
Terms: price variance
Objective: 5
AACSB: Reflective thinking

35) The price variance is the difference between the actual price and the budgeted price of the input, multiplied by the actual quantity of input.
Answer: TRUE
Diff: 1
Terms: price variance
Objective: 5
AACSB: Reflective thinking

36) For any actual level of output, the efficiency variance is the difference between actual quantity of input used and the budgeted quantity of input allowed to produce actual output, multiplied by the budgeted price.
Answer: TRUE
Diff: 1
Terms: efficiency variance
Objective: 5
AACSB: Reflective thinking

37) The use of high-quality raw materials is likely to result in a favorable efficiency variance and an unfavorable price variance.
Answer: TRUE
Diff: 2
Terms: efficiency variance, price variance
Objective: 5
AACSB: Reflective thinking
38) The direct manufacturing labor price variance is likely to be unfavorable if lower-skilled workers are put on a job.
Answer: FALSE
Explanation: The direct manufacturing labor variance is likely to be favorable if lower-skilled workers are put on a job since they are usually also lower paid.
Diff: 2
Terms: price variance
Objective: 5
AACSB: Reflective thinking

39) Although computed separately, price variances and efficiency variances should NOT be analyzed separately from each other.
Answer: TRUE
Diff: 2
Terms: price variance, efficiency variance
Objective: 5
AACSB: Reflective thinking
40) Madzinga's Draperies manufactures curtains. A certain window requires the following:

- Direct materials standard: 10 square yards at $5 per yard
- Direct manufacturing labor standard: 5 hours at $10

During the second quarter, the company made 1,500 curtains and used 14,000 square yards of fabric costing $68,600. Direct labor totaled 7,600 hours for $79,800.

**Required:**

a. Compute the direct materials price and efficiency variances for the quarter.

b. Compute the direct manufacturing labor price and efficiency variances for the quarter.

**Answer:**

a. Direct materials variances:

\[
\begin{align*}
\text{Actual unit cost} &= \frac{$68,600}{14,000 \text{ square yards}} \\
&= $4.90 \text{ per square yard} \\
\text{Price variance} &= 14,000 \times ($5.00 - $4.90) \\
&= $1,400 \text{ favorable} \\
\text{Efficiency variance} &= $5.00 \times [14,000 - (1,500 \times 10)] \\
&= $5,000 \text{ favorable}
\end{align*}
\]

b. Direct manufacturing labor variances:

\[
\begin{align*}
\text{Actual labor rate} &= \frac{$79,800}{7,600} \\
&= $10.50 \text{ per hour} \\
\text{Price variance} &= 7,600 \times ($10.50 - $10.00) \\
&= $3,800 \text{ unfavorable} \\
\text{Efficiency variance} &= $10.00 \times (7,600 - 7,500) \\
&= $1,000 \text{ unfavorable}
\end{align*}
\]

**Diff:** 2

Terms: price variance, efficiency variance

Objective: 5

AACSB: Analytical skills
Wilson's Winter Woolens manufactures jackets and other wool clothing. A certain designed ski parka requires the following:

- Direct materials standard: 2 square yards at $13.50 per yard
- Direct manufacturing labor standard: 1.5 hours at $20.00 per hour

During the third quarter, the company made 1,500 parkas and used 3,150 square yards of fabric costing $39,375. Direct labor totaled 2,100 hours for $45,150.

**Required:**

a. Compute the direct materials price and efficiency variances for the quarter.
b. Compute the direct manufacturing labor price and efficiency variances for the quarter.

**Answer:**

a. **Direct materials variances:**

   - Actual unit cost: $39,375 / 3,150 square yards = $12.50 per square yard
   - Price variance: 3,150 × ($13.50 - $12.50) = $3,150 favorable
   - Efficiency variance: $13.50 × [3,150 - (1,500 × 2)] = $2,025 unfavorable

b. **Direct manufacturing labor variances:**

   - Actual labor rate: $45,150 / 2,100 = $21.50 per hour
   - Price variance: 2,100 × ($21.50 - $20.00) = $3,150 unfavorable
   - Efficiency variance: $20.00 × (2,100 - (1,500 × 1.5)) = $3,000 favorable

**Diff: 2**

**Terms:** price variance, efficiency variance

**Objective:** 5

**AACSB:** Analytical skills
42) The following data for the Alma Company pertain to the production of 1,000 urns during August.

Direct Materials (all materials purchased were used):

| Standard cost: $6.00 per pound of urn. |
| Total actual cost: $5,600. |
| Standard cost allowed for units produced was $6,000. |
| Materials efficiency variance was $120 unfavorable. |

Direct Manufacturing Labor:

| Standard cost is 2 urns per hour at $24.00 per hour. |
| Actual cost per hour was $24.50. |
| Labor efficiency variance was $336 favorable. |

Required:

a. What is standard direct material amount per urn?

b. What is the direct material price variance?

c. What is the total actual cost of direct manufacturing labor?

d. What is the labor price variance for direct manufacturing labor?

Answer:

a. Standard cost per urn = $6,000/1,000

b. Materials price variance = Total variance - efficiency variance

| = ($5,600 - $6,000) - $120 unfavorable |
| = $520 favorable |

c. Total standard labor cost of actual hours = ((1,000/2) × $24) - $336 favorable

| = $11,664 |
| = $11,664/24 = 486 hours |
| = 486 × $24.50 = $11,907 |

d. Labor price variance = $11,907 - $11,664

| = $243 unfavorable |

Diff: 3
Terms: price variance, efficiency variance
Objective: 5
AACSB: Analytical skills
43) The following data for the Lewgrow Garden Supplies Company pertains to the production of 2,500 garden spades during March. The spade consists of a wooden handle and a metal forged tool that comes in contact with the ground.

Direct Materials (all materials purchased were used):

   Standard cost: $1.00 per handle and $3.50 per metal tool.
   Total actual cost: $11,350.
   Materials flexible-budget efficiency variance was $650 unfavorable.

Direct Manufacturing Labor:

   Standard cost is 5 garden spades per hour at $20.00 per hour.
   Actual cost per hour was $21.00.
   Labor efficiency variance was $400 favorable.

Required:

a. What is the standard direct material amount per garden spade?
b. What is the standard cost allowed for all units produced?
c. What is the total direct materials flexible-budget variance?
d. What is the direct material flexible-budget price variance?
e. What is the total actual cost of direct manufacturing labor?
f. What is the labor price variance for direct manufacturing labor?

Answer:

a. Standard cost per garden spade
   = $1.00 (handle) + $3.50 (tool)
   = $4.50 per garden spade

b. Standard cost allowed for all units
   = 2,500 x $4.50
   = $11,250 per garden spade

c. Total materials variance
   = $11,250 - $11,350
   = $100 unfavorable

d. Materials price variance
   = Total variance - efficiency variance
   = ($11,350 - $11,250) - $650 unfavorable
   = $550 favorable

e. Total standard labor cost of actual hours
   = ((2,500/5) x $20) - $400 favorable
   = $9,600
   Actual hours
   = $9,600/20 = 480 hours
   Total actual costs
   = 480 x $21 = $10,080

f. Labor price variance
   = $9,600 - $10,080
   = $480 unfavorable

Diff: 3
Terms: price variance, efficiency variance
Objective: 5
AACSB: Analytical skills
44) The following data for the telephone company pertain to the production of 450 rolls of telephone wire during June. Selected items are omitted because the costing records were lost in a windstorm.

Direct Materials (All materials purchased were used.)

Standard cost per roll: __a__ pounds at $4.00 per pound.
Total actual cost: __b__ pounds costing $9,600.
Standard cost allowed for units produced was $9,000.
Materials price variance: __c__.
Materials efficiency variance was $80 unfavorable.

Direct Manufacturing Labor

Standard cost is 3 hours per roll at $8.00 per hour.
Actual cost per hour was $8.25.
Total actual cost: __d__.
Labor price variance: __e__.
Labor efficiency variance was $400 unfavorable.

**Required:**
Compute the missing elements in the report represented by the lettered items.

**Answer:**

a. Standard cost per roll  
   = $9,000/450 = $20.00
   Standard number of pounds per roll  
   = $20/$4 = 5 pounds per roll

b. Actual pounds  
   = ($9,000 + $80)/$4  
   = 2,270 pounds

c. Materials price variance  
   = $9,600 - ($9,000 + $80)  
   = $520 unfavorable

d. Total standard labor cost of actual hours  
   = (450 × 3 × $8) + $400  
   = $11,200  
   Actual hours  
   = $11,200/$8 = 1,400  
   Total actual cost  
   = 1,400 × $8.25  
   = $11,550  

e. Labor price variance  
   = $11,550 - $11,200  
   = $350 unfavorable

**Diff:** 3
**Terms:** standard cost, price variance, efficiency variance
**Objective:** 5
**AACSB:** Analytical skills
45) Littrell Company produces chairs and has determined the following direct cost categories and budgeted amounts:

<table>
<thead>
<tr>
<th>Category</th>
<th>Standard Inputs for 1 output</th>
<th>Standard Cost per input</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Materials</td>
<td>1.00</td>
<td>$7.50</td>
</tr>
<tr>
<td>Direct Labor</td>
<td>0.30</td>
<td>9.00</td>
</tr>
<tr>
<td>Direct Marketing</td>
<td>0.50</td>
<td>3.00</td>
</tr>
</tbody>
</table>

Actual performance for the company is shown below:

Actual output: (in units) 4,000

Direct Materials:
- Materials costs $30,225
- Input purchased and used 3,900
- Actual price per input $7.75

Direct Manufacturing Labor:
- Labor costs $11,470
- Labor-hours of input 1,240
- Actual price per hour $9.25

Direct Marketing Labor:
- Labor costs $5,880
- Labor-hours of input 2,100
- Actual price per hour $2.80

**Required:**

a. What is the combined total of the flexible-budget variances?

b. What is the price variance of the direct materials?

c. What is the price variance of the direct manufacturing labor and the direct marketing labor, respectively?

d. What is the efficiency variance for direct materials?

e. What are the efficiency variances for direct manufacturing labor and direct marketing labor, respectively?

**Answer:**

a. | Actual Results | Flexible Budget | Variances |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$30,225</td>
<td>$30,000</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>$11,470</td>
<td>10,800</td>
</tr>
<tr>
<td>Direct marketing labor</td>
<td>$5,880</td>
<td>6,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$47,575</strong></td>
<td><strong>$46,800</strong></td>
</tr>
</tbody>
</table>

b. ($7.75 - $7.50) × (3,900) = $975 unfavorable

c. Manufacturing Labor ($9.25 - $9.00) × 1,240 = $310 unfavorable
   Marketing Labor ($2.80 - $3.00) × 2,100 = $420 favorable

d. [3,900 - (4,000 units × 1.00)] × $7.50 = $750 favorable

e. Manufacturing Labor = [1,240 hours - (4,000 × 0.30 hours)] × $9.00 = $360 unfavorable
   Marketing Labor = [2,100 hours - (4,000 × 0.50 hours)] × $3.00 = $300.00 unfavorable

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46) Give at least three good reasons why a favorable price variance for direct materials might be reported.
Answer: Any three of the following:
   a. The purchasing manager skillfully negotiated a better purchase price.
   b. The purchasing manager changed to a lower-priced supplier.
   c. The purchasing manager purchased in larger quantities resulting in quantity discounts.
   d. The purchasing manager changed to lower-quality materials.
   e. An unexpected industry oversupply resulted in decreased prices for materials.
   f. Budgeted purchase prices were not carefully set.

Diff: 3
Terms: price variance
Objective: 5
AACSB: Analytical skills

47) Give at least three good reasons why an unfavorable efficiency variance for direct manufacturing labor might be reported.
Answer: Any three of the following:
   a. More lower-skilled workers were scheduled than planned.
   b. Work was inefficiently scheduled.
   c. Machines were not properly maintained.
   d. Budgeted time standards were too tight.

Diff: 3
Terms: efficiency variance
Objective: 5
AACSB: Analytical skills

Objective 7.6

1) A purchasing manager's performance is best evaluated using the:
   A) direct materials price variance
   B) direct materials flexible-budget variance
   C) direct manufacturing labor flexible-budget variance
   D) affect the manager's action has on total costs for the entire company
Answer: D
Diff: 3
Terms: variance
Objective: 6
AACSB: Reflective thinking
2) One of the primary reasons for using cost variances is:
A) they diagnose the cause of a problem and what should be done to correct it
B) for superiors to communicate expectations to lower-level employees
C) to administer appropriate disciplinary action
D) for financial control of operating activities and understanding why variances arise
Answer: D
Diff: 2
Terms: variance
Objective: 6
AACSB: Reflective thinking

3) A favorable cost variance of significant magnitude:
A) is the result of good planning
B) if investigated, may lead to improved production methods
C) indicates management does not need to be concerned about lax standards
D) does not need to be investigated
Answer: B
Diff: 3
Terms: favorable variance
Objective: 6
AACSB: Reflective thinking

4) The variances that should be investigated by management include:
A) only unfavorable variances
B) only favorable variances
C) all variances, both favorable and unfavorable
D) both favorable and unfavorable variances considered significant in amount for the company
Answer: D
Diff: 1
Terms: variance
Objective: 6
AACSB: Reflective thinking

5) Typically, managers have the LEAST control over:
A) the direct material price variance
B) the direct material efficiency variance
C) machine maintenance
D) the scheduling of production
Answer: A
Diff: 2
Terms: price variance
Objective: 6
AACSB: Reflective thinking
6) If manufacturing machines are breaking down more than expected, this will contribute to a(n):
A) favorable direct manufacturing labor price variance
B) unfavorable direct manufacturing labor price variance
C) favorable direct manufacturing labor efficiency variance
D) unfavorable direct manufacturing labor efficiency variance
Answer: D
Diff: 2
Terms: efficiency variance
Objective: 6
AACSB: Reflective thinking

7) A single variance:
A) signals the cause of a problem
B) should be evaluated in isolation from other variances
C) may be the result of many different problems
D) should be used for performance evaluation
Answer: C
Diff: 2
Terms: variance
Objective: 6
AACSB: Reflective thinking

8) Variance analysis should be used:
A) to understand why variances arise
B) as the sole source of information for performance evaluation
C) to punish employees that do not meet standards
D) to encourage employees to focus on meeting standards
Answer: A
Diff: 3
Terms: variance
Objective: 6
AACSB: Ethical reasoning

9) Variances should be investigated:
A) when they are kept below a certain amount
B) when there is a small variance for critical items such as product defects
C) even though the cost of investigation exceeds the benefit
D) when there is an in-control occurrence
Answer: B
Diff: 3
Terms: variance
Objective: 6
AACSB: Ethical reasoning
10) When continuous improvement budgeted costing is implemented, cost reductions can result from:
A) price reductions
B) reducing materials waste
C) producing products faster and more efficiently
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: variance
Objective: 6
AACSB: Reflective thinking

11) Nonfinancial performance measures:
A) are usually used in combination with financial measures for control purposes
B) are used to evaluate overall cost efficiency
C) allow managers to make informed tradeoffs
D) are often the sole basis of a manager's performance evaluations
Answer: A
Diff: 3
Terms: variance
Objective: 6
AACSB: Reflective thinking

12) Unfavorable direct material price variances are:
A) always credits
B) always debits
C) credited to the Materials Control account
D) credited to the Accounts Payable Control account
Answer: B
Diff: 1
Terms: price variance
Objective: 6
AACSB: Reflective thinking

13) Favorable direct manufacturing labor efficiency variances are:
A) always credits
B) always debits
C) debited to the Work-in-Process Control account
D) debited to the Wages Payable Control account
Answer: A
Diff: 1
Terms: efficiency variance
Objective: 6
AACSB: Reflective thinking
14) From the perspective of control, the direct materials efficiency variance should be isolated at the time of:
   A) purchase
   B) use
   C) completion of the entire product
   D) sale of the product
   Answer: B
   Diff: 2
   Terms: efficiency variance
   Objective: 6
   AACSB: Reflective thinking

15) Standard costing systems are a useful tool when using:
   A) just-in-time systems
   B) total quality management
   C) computer-integrated manufacturing systems
   D) All of these answers are correct.
   Answer: D
   Diff: 2
   Terms: standard cost
   Objective: 6
   AACSB: Reflective thinking

16) Repeatedly identifying causes of variances, initiating corrective actions, and evaluating results of actions is an example of
   A) efficiency.
   B) effectiveness.
   C) continuous improvement.
   D) All of these answers are correct.
   Answer: C
   Diff: 2
   Terms: variance
   Objective: 6
   AACSB: Reflective thinking

17) The relative amount of inputs used to achieve a given output level is known as
   A) efficiency.
   B) effectiveness.
   C) continuous improvement.
   D) All of these answers are correct.
   Answer: A
   Diff: 2
   Terms: variance
   Objective: 6
   AACSB: Reflective thinking
18) A favorable variance can be automatically interpreted as "good news."
Answer: FALSE
Explanation: A favorable variance may not be good news at all because it adversely affects other variances that increase total costs.
Diff: 1
Terms: favorable variance
Objective: 6
AACSB: Reflective thinking

19) Variances often affect each other.
Answer: TRUE
Diff: 1
Terms: variance
Objective: 6
AACSB: Analytical skills

20) If variance analysis is used for performance evaluation, managers are encouraged to meet targets using creativity and resourcefulness.
Answer: FALSE
Explanation: The most common outcome when variance analysis is used for performance evaluation is that managers seek targets that are easily attainable and avoid targets that require creativity and resourcefulness.
Diff: 2
Terms: variance
Objective: 6
AACSB: Ethical reasoning

21) When using variance for performance evaluation, managers often focus on effectiveness and efficiency as two of the common attributes used in comparing expected results with actual results.
Answer: TRUE
Diff: 2
Terms: variance
Objective: 6
AACSB: Ethical reasoning

22) For critical items such as product defects, a small variance may prompt investigation.
Answer: TRUE
Diff: 2
Terms: variance
Objective: 6
AACSB: Analytical skills

23) A particular variance generally signals one particular problem.
Answer: FALSE
Explanation: There are many potential causes of a single variance.
Diff: 1
Terms: variance
Objective: 6
AACSB: Analytical skills
24) If budgets contain slack, cost variances will tend to be favorable.
Answer: TRUE
Diff: 2
Terms: favorable variance
Objective: 6
AACSB: Analytical skills

25) Continuous improvement budgeted costs target price reductions and efficiency improvements.
Answer: TRUE
Diff: 1
Terms: standard cost
Objective: 6
AACSB: Analytical skills

26) Improvement opportunities are easier to identify when products have been on the market for a considerable period of time.
Answer: FALSE
Explanation: Improvement opportunities are easier to identify when products are first produced.
Diff: 2
Terms: variance
Objective: 6
AACSB: Reflective thinking

27) It is best to rely totally on financial performance measures rather than using a combination of financial and nonfinancial performance measures.
Answer: FALSE
Explanation: It is best to rely on a combination of financial and nonfinancial performance measures.
Diff: 2
Terms: variance
Objective: 6
AACSB: Reflective thinking

28) From the perspective of control, the direct materials price variance should be isolated at the time of purchase.
Answer: TRUE
Diff: 2
Terms: price variance
Objective: 6
AACSB: Reflective thinking

29) The goal of variance analysis is for managers to understand why variances arise, to learn, and to improve future performance.
Answer: TRUE
Diff: 2
Terms: variance
Objective: 6
AACSB: Communication
30) Employees logging in to production floor terminals and other modern technologies greatly facilitate the use of a standard costing system.
Answer: TRUE
Diff: 1
Terms: standard cost
Objective: 6
AACSB: Reflective thinking

31) Possible operational causes of an unfavorable direct materials efficiency variance include poor design of products or processes.
Answer: TRUE
Diff: 1
Terms: variance
Objective: 6
AACSB: Reflective thinking

32) Effectiveness is the relative amount of inputs used to achieve a given output level.
Answer: FALSE
Explanation: Efficiency is the relative amount of inputs used to achieve a given output level.
Diff: 1
Terms: price variance
Objective: 6
AACSB: Reflective thinking
33) Coffey Company maintains a very large direct materials inventory because of critical demands placed upon it for rush orders from large hospitals. Item A contains hard-to-get material Y. Currently, the standard cost of material Y is $4.00 per gram. During February, 22,000 grams were purchased for $4.10 per gram, while only 20,000 grams were used in production. There was no beginning inventory of material Y.

**Required:**

a. Determine the direct materials price variance, assuming that all materials costs are the responsibility of the materials purchasing manager.

b. Determine the direct materials price variance, assuming that all materials costs are the responsibility of the production manager.

c. Discuss the issues involved in determining the price variance at the point of purchase versus the point of consumption.

**Answer:**

a. Material price variance = 22,000 × ($4.10 - $4.00) = $2,200 unfavorable

b. Material price variance = 20,000 × ($4.10 - $4.00) = $2,000 unfavorable

c. Measuring the price variance at the time of materials purchased is desirable in situations where the amount of materials purchased varies substantially from the amount used during the period. Failure to measure the price variance based on materials purchased could result in a substantial delay in determining that a price change occurred.

Also, if the purchasing manager is to be held accountable for his/her purchasing activities, it is appropriate to have the materials price variances computed at the time of purchase so the manager can include the variances on his/her monthly report. This encourages the purchasing manager to be more responsible for the activities under his/her control. It provides a closer relationship between responsibility and authority and becomes a relevant performance measure.

**Diff:** 2

**Terms:** price variance, efficiency variance

**Objective:** 5, 6

**AACSB:** Analytical skills
34) During February the Lungren Manufacturing Company's costing system reported several variances that the production manager was surprised to see. Most of the company's monthly variances are under $125, even though they may be either favorable or unfavorable. The following information is for the manufacture of garden gates, its only product:

1. Direct materials price variance, $800 unfavorable.
2. Direct materials efficiency variance, $1,800 favorable.
3. Direct manufacturing labor price variance, $4,000 favorable.
4. Direct manufacturing labor efficiency variance, $600 unfavorable.

Required:

a. Provide the manager with some ideas as to what may have caused the price variances.
b. What may have caused the efficiency variances?

Answer:
a. Direct materials' unfavorable price variance may have been caused by: (1) paying a higher price than the standard for the period, (2) changing to a new vendor, or (3) buying higher-quality materials.

Direct manufacturing labor's favorable price variance may have been caused by: (1) changing the work force by hiring lower-paid employees, (2) changing the mix of skilled and unskilled workers, or (3) not giving pay raises as high as anticipated when the standards were set for the year.

b. Direct materials' favorable efficiency variance may have been caused by: (1) employees/machinery working more efficiency and having less scrap and waste materials, (2) buying better-quality materials, or (3) changing the production process.

Direct manufacturing labor's unfavorable efficiency variance may have been caused by: (1) poor working conditions, (2) changes in the production process (learning something new initially takes longer), (3) different types of direct materials to work with, or (4) poor attitudes on behalf of the workers.

Diff: 3
Terms: price variance, efficiency variance
Objective: 6
AACSB: Analytical skills
35) Mayberry Company had the following journal entries recorded for the end of June. Unfortunately, the company's only accountant quit on July 10 and the president is at a loss as to the company's performance for the month of June.

Materials Control 300,000
  Direct Materials Price Variance 10,000
  Accounts Payable Control 290,000

Work-in-Process Control 120,000
  Direct Materials Efficiency Variance 8,000
  Materials Control 128,000

Work-in-Process Control 850,000
  Direct Manufacturing Labor Price Variance 15,000
  Direct Manufacturing Labor Efficiency Variance 18,000
  Wages Payable Control 847,000

Required:
a. What kind of performance did the company have for June? Explain each variance.
b. Why is Direct Materials given in two entries?

Answer:
a. The first entry is for materials purchases. The credit entry indicates a favorable variance. This could be an indicator that the purchasing agent did a good job or he/she bought inferior goods.

Production was not as lucky in June. The debit entry for materials efficiency indicates that more materials were used than should have been under the operating plans for the month.

For labor, the price was unfavorable, while the efficiency was favorable. This could have been caused by using higher-priced workers who were, in fact, better workers. Of course, there are many other possible causes.

b. Recoding variances for direct materials is completed with two separate entries since the price variance is isolated at the point of purchase, while the efficiency variance is isolated at the point of use.

Diff: 2
Terms: price variance, efficiency variance, standard cost
Objective: 6
AACSB: Analytical skills
36) Waddell Productions makes separate journal entries for all cost accounting-related activities. It uses a standard cost system for all manufacturing items. For the month of June, the following activities have taken place:

- Direct Manufacturing Materials Purchased $300,000
- Direct Manufacturing Materials Used 250,000
- Direct Materials Price Variance 10,000 unfavorable (at time of purchase)
- Direct Materials Efficiency Variance 15,000 favorable
- Direct Manufacturing Labor Price Variance 6,000 favorable
- Direct Manufacturing Labor Efficiency Variance 4,000 favorable
- Direct Manufacturing Labor Payable 170,000

**Required:**
Record the necessary journal entries to close the accounts for the month.

**Answer:**
- Materials Control 300,000
- Direct Manufacturing Materials Price Variance 10,000
- Accounts Payable Control 310,000
- Work-in-Process Control 265,000
- Direct Materials Efficiency Variance 15,000
- Materials Control 250,000
- Work-in-Process Control 180,000
- Direct Manufacturing Labor Price Variance 6,000
- Direct Manufacturing Labor Efficiency Variance 4,000
- Wages Payable Control 170,000

Diff: 3
Terms: price variance, efficiency variance, standard cost
Objective: 6
AACSB: Analytical skills

37) Describe the purpose of variance analysis.

**Answer:** Variance analysis should help the company learn about what happened and how to perform better and should not be a tool in playing the "blame game."

Diff: 2
Terms: variance
Objective: 6
AACSB: Reflective thinking
Objective 7.7

1) The process by which a company's products or services are measured relative to the best possible levels of performance is known as:
   A) efficiency
   B) benchmarking
   C) a standard costing system
   D) variance analysis
   Answer: B
   Diff: 1
   Terms: benchmarking
   Objective: 7
   AACSB: Reflective thinking

2) When benchmarking:
   A) the best levels of performance are usually found in companies that are within different industries
   B) finding appropriate benchmarks is a minor issue
   C) comparisons can highlight areas for better future cost management
   D) Both A and C are correct.
   Answer: C
   Diff: 2
   Terms: benchmarking
   Objective: 7
   AACSB: Reflective thinking

3) Ensuring benchmark numbers are comparable can be difficult because differences can exist across companies with:
   A) overall company strategy
   B) depreciation methods
   C) inventory methods
   D) All of these answers are correct.
   Answer: D
   Diff: 2
   Terms: benchmarking
   Objective: 7
   AACSB: Reflective thinking

4) When benchmarking, management accountants are MOST valuable when they:
   A) present differences in the benchmarking data to management
   B) highlight differences in the benchmarking data to management
   C) provide insight into why costs or revenues differ across companies
   D) provide complex mathematical analysis
   Answer: C
   Diff: 2
   Terms: benchmarking
   Objective: 7
   AACSB: Communication
5) Benchmarking is the continuous process of measuring products, services, and activities against the best possible levels of performance, either inside or outside the organization.
Answer: TRUE
Diff: 1
Terms: benchmarking
Objective: 7
AACSB: Reflective thinking

6) When benchmarking, the best levels of performance are typically found in companies that are totally different.
Answer: FALSE
Explanation: When benchmarking, the best levels of performance are typically found in competing companies or in companies having similar processes.
Diff: 1
Terms: benchmarking
Objective: 7
AACSB: Reflective thinking

7) One problem with benchmarking is ensuring that numbers are comparable.
Answer: TRUE
Diff: 1
Terms: benchmarking
Objective: 7
AACSB: Reflective thinking

8) When benchmarking it is best when management accountants simply analyze the costs and allow management to provide the insight as to why the revenues and costs differ between companies.
Answer: FALSE
Explanation: When benchmarking, management accountants are more valuable when they analyze the costs and also provide management with insight as to why the revenues and costs differ between companies.
Diff: 1
Terms: benchmarking
Objective: 7
AACSB: Communication

9) What is benchmarking, and how is it useful to a company?
Answer: Benchmarking is the continuous process of comparing the levels of performance in producing products and services and executing activities against the best levels of performance in competing companies or in companies having similar processes. Companies can examine aspects of their own operations in comparison to similar operations and see if they are operating at a disadvantage. Benchmarking might provide targets and opportunities to cut costs, and might even show where they have a competitive advantage over similar companies.
Diff: 2
Terms: benchmarking
Objective: 7
AACSB: Reflective thinking
Cost Accounting, 14e (Horngren/Datar/Rajan)
Chapter 8  Flexible Budgets, Overhead Cost Variances, and Management Control

Objective 8.1

1) Overhead costs have been increasing due to all of the following EXCEPT:
A) increased automation
B) more complexity in distribution processes
C) tracing more costs as direct costs with the help of technology
D) product proliferation
Answer:  C
Diff: 3
Terms:  total-overhead variance
Objective:  1
AACSB:  Reflective thinking

2) Effective planning of variable overhead costs means that a company performs those variable overhead costs that primarily add value for:
A) the current shareholders
B) the customer using the products or services
C) plant employees
D) major suppliers of component parts
Answer:  B
Diff: 2
Terms:  total-overhead variance
Objective:  1
AACSB:  Reflective thinking

3) Variable overhead costs include:
A) plant-leasing costs
B) the plant manager's salary
C) depreciation on plant equipment
D) machine maintenance
Answer:  D
Diff: 1
Terms:  total-overhead variance
Objective:  1
AACSB:  Reflective thinking

4) Fixed overhead costs include:
A) the cost of sales commissions
B) property taxes paid on plant facilities
C) energy costs
D) indirect materials
Answer:  B
Diff: 1
Terms:  total-overhead variance
Objective:  1
AACSB:  Reflective thinking
5) Effective planning of fixed overhead costs includes all of the following EXCEPT:
A) planning day-to-day operational decisions  
B) eliminating nonvalue-added costs  
C) planning to be efficient  
D) choosing the appropriate level of capacity  
Answer: A  
Diff: 3  
Terms: total-overhead variance  
Objective: 1  
AACSB: Reflective thinking

6) Effective planning of variable overhead includes all of the following EXCEPT:
A) choosing the appropriate level of capacity  
B) eliminating nonvalue-adding costs  
C) redesigning products to use fewer resources  
D) redesigning the plant layout for more efficient processing  
Answer: A  
Diff: 2  
Terms: total-overhead variance  
Objective: 1  
AACSB: Reflective thinking

7) Choosing the appropriate level of capacity:
A) is a key strategic decision  
B) may lead to loss of sales if overestimated  
C) may lead to idle capacity if underestimated  
D) All of these answers are correct.  
Answer: A  
Diff: 2  
Terms: production-volume variance  
Objective: 1  
AACSB: Ethical reasoning

8) The major challenge when planning fixed overhead is:
A) calculating total costs  
B) calculating the cost-allocation rate  
C) choosing the appropriate level of capacity  
D) choosing the appropriate planning period  
Answer: C  
Diff: 3  
Terms: production-volume variance  
Objective: 1  
AACSB: Reflective thinking
9) Overhead costs are a major part of costs for most companies—more than 50% of all costs for some companies.
Answer: TRUE
Diff: 1
Terms: total-overhead variance
Objective: 1
AACSB: Reflective thinking

10) At the start of the budget period, management will have made most decisions regarding the level of fixed overhead costs to be incurred.
Answer: TRUE
Diff: 1
Terms: total-overhead variance
Objective: 1
AACSB: Ethical reasoning

11) One way to manage both variable and fixed overhead costs is to eliminate value-adding activities.
Answer: FALSE
Explanation: One way to manage both variable and fixed overhead costs is to eliminate non-value-adding activities.
Diff: 1
Terms: total-overhead variance
Objective: 1
AACSB: Reflective thinking

12) The planning of fixed overhead costs does NOT differ from the planning of variable overhead costs.
Answer: FALSE
Explanation: The planning of fixed overhead costs differs from the planning of variable overhead costs in one important respect, timing. The level of fixed costs to be incurred will have been mostly decided upon at the start of the budget period, but the day-to-day ongoing operations decisions will be the main determinant in the level of variable overhead costs to be incurred in the period.
Diff: 1
Terms: total-overhead variance
Objective: 1
AACSB: Reflective thinking
13) Jael Equipment uses a flexible budget for its indirect manufacturing costs. For 20X5, the company anticipated that it would produce 18,000 units with 3,500 machine-hours and 7,200 employee days. The costs and cost drivers were to be as follows:

<table>
<thead>
<tr>
<th>Cost Driver</th>
<th>Fixed</th>
<th>Variable</th>
<th>Cost driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product handling</td>
<td>$30,000</td>
<td>$0.40</td>
<td>per unit</td>
</tr>
<tr>
<td>Inspection</td>
<td>8,000</td>
<td>8.00</td>
<td>per 100 unit batch</td>
</tr>
<tr>
<td>Utilities</td>
<td>400</td>
<td>4.00</td>
<td>per 100 unit batch</td>
</tr>
<tr>
<td>Maintenance</td>
<td>1,000</td>
<td>0.20</td>
<td>per machine-hour</td>
</tr>
<tr>
<td>Supplies</td>
<td></td>
<td>5.00</td>
<td>per employee day</td>
</tr>
</tbody>
</table>

During the year, the company processed 20,000 units, worked 7,500 employee days, and had 4,000 machine-hours. The actual costs for 20X5 were:

<table>
<thead>
<tr>
<th>Actual costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product handling</td>
</tr>
<tr>
<td>Inspection</td>
</tr>
<tr>
<td>Utilities</td>
</tr>
<tr>
<td>Maintenance</td>
</tr>
<tr>
<td>Supplies</td>
</tr>
</tbody>
</table>

**Required:**

a. Prepare the static budget using the overhead items above and then compute the static-budget variances.

b. Prepare the flexible budget using the overhead items above and then compute the flexible-budget variances.

**Answer:**

a. **Jael Equipment**

   **Overhead Static Budget with Variances**

   **20X5**

<table>
<thead>
<tr>
<th></th>
<th><strong>Actual</strong></th>
<th><strong>Budget</strong></th>
<th><strong>Variances</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Product handling</td>
<td>$36,000</td>
<td>$37,200</td>
<td>$1,200 F</td>
</tr>
<tr>
<td>Inspection</td>
<td>9,000</td>
<td>9,440</td>
<td>440 F</td>
</tr>
<tr>
<td>Utilities</td>
<td>1,600</td>
<td>1,120</td>
<td>480 U</td>
</tr>
<tr>
<td>Maintenance</td>
<td>1,200</td>
<td>1,700</td>
<td>500 F</td>
</tr>
<tr>
<td>Supplies</td>
<td>37,500</td>
<td>36,000</td>
<td>1,500 U</td>
</tr>
<tr>
<td>Total</td>
<td><strong>$85,300</strong></td>
<td><strong>$85,460</strong></td>
<td><strong>$160 F</strong></td>
</tr>
</tbody>
</table>

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b. Jael Equipment
Overhead Flexible Budget with Variances
20X5

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Budget</th>
<th>Variances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product handling</td>
<td>$36,000</td>
<td>$38,000</td>
<td>$2,000 F</td>
</tr>
<tr>
<td>Inspection</td>
<td>9,000</td>
<td>9,600</td>
<td>600 F</td>
</tr>
<tr>
<td>Utilities</td>
<td>1,600</td>
<td>1,200</td>
<td>400 U</td>
</tr>
<tr>
<td>Maintenance</td>
<td>1,200</td>
<td>1,800</td>
<td>600 F</td>
</tr>
<tr>
<td>Supplies</td>
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<td>37,500</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$85,300</td>
<td>$88,100</td>
<td><strong>$2,800</strong> F</td>
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</tbody>
</table>

Diff: 2
Terms: fxd ovrhd flex-bud/spending, prod-vol, var ovrhd spending, var ovrhd efficiency var
Objective: 1
AACSB: Analytical skills

Objective 8.2

1) In a standard costing system, a cost-allocation base would most likely be:
A) actual machine-hours
B) normal machine-hours
C) standard machine-hours
D) Any of these answers is correct.
Answer: C
Diff: 3
Terms: standard costing
Objective: 2
AACSB: Reflective thinking

2) For calculating the costs of products and services, a standard costing system:
A) only requires a simple recording system
B) uses standard costs to determine the cost of products
C) does not have to keep track of actual costs
D) All of these answers are correct.
Answer: D
Diff: 3
Terms: standard costing
Objective: 2
AACSB: Reflective thinking
3) Which of the following is NOT a step in developing budgeted variable overhead rates?
A) identifying the variable overhead costs associated with each cost-allocation base
B) estimating the budgeted denominator level based on expected utilization of available capacity
C) selecting the cost-allocation bases to use
D) choosing the period to be used for the budget
Answer: B
Diff: 2
Terms: variable overhead rate
Objective: 2
AACSB: Analytical skills

4) Which of the following is NOT a step in developing budgeted fixed overhead rates?
A) Choose the period to use for the budget.
B) Select the cost-allocation bases to use in allocating fixed overhead costs to output produced.
C) Identify the fixed overhead costs associated with each cost-allocation base.
D) All of the above are steps in developing budgeted fixed overhead rates.
Answer: D
Diff: 2
Terms: fixed overhead rate
Objective: 2
AACSB: Analytical skills

5) In flexible budgets, costs that remain the same regardless of the output levels within the relevant range are:
A) allocated costs
B) budgeted costs
C) fixed costs
D) variable costs
Answer: C
Diff: 1
Terms: total-overhead variance
Objective: 2
AACSB: Reflective thinking
Willis Corporation manufactures industrial-sized gas furnaces and uses budgeted machine-hours to allocate variable manufacturing overhead. The following information pertains to the company's manufacturing overhead data:

<table>
<thead>
<tr>
<th>Budgeted output units</th>
<th>30,000 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted machine-hours</td>
<td>10,000 hours</td>
</tr>
<tr>
<td>Budgeted variable manufacturing overhead costs for 15,000 units</td>
<td>$322,500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Actual output units produced</th>
<th>44,000 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual machine-hours used</td>
<td>14,400 hours</td>
</tr>
<tr>
<td>Actual variable manufacturing overhead costs</td>
<td>$484,000</td>
</tr>
</tbody>
</table>

6) What is the budgeted variable overhead cost rate per output unit?
   A) $10.75
   B) $11.00
   C) $32.25
   D) $48.40

   Answer: A
   Explanation: A) $322,500/30,000 = $10.75
   Diff: 2
   Terms: total-overhead variance
   Objective: 2
   AACSB: Analytical skills
Answer the following questions using the information below:

Christine Corporation manufactures baseball uniforms and uses budgeted machine-hours to allocate variable manufacturing overhead. The following information pertains to the company's manufacturing overhead data:

<table>
<thead>
<tr>
<th>Budgeted output units</th>
<th>10,000 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted machine-hours</td>
<td>15,000 hours</td>
</tr>
<tr>
<td>Budgeted variable manufacturing overhead costs for 20,000 units</td>
<td>$180,000</td>
</tr>
</tbody>
</table>

Actual output units produced | 9,000 units |
Actual machine-hours used | 14,000 hours |
Actual variable manufacturing overhead costs | $171,000 |

7) What is the budgeted variable overhead cost rate per output unit?
   A) $12.00
   B) $12.21
   C) $18.00
   D) $19.00
   Answer: C
   Explanation: C) $180,000/10,000 = $18.00
   Diff: 2
   Terms: total-overhead variance
   Objective: 2
   AACSB: Analytical skills
Answer the following questions using the information below:

Fearless Frank's Fertilizer Farm produces fertilizer and distributes the product by using his tanker trucks. Frank's uses budgeted fleet hours to allocate variable manufacturing overhead. The following information pertains to the company's manufacturing overhead data:

<table>
<thead>
<tr>
<th>Budgeted output units</th>
<th>600 truckloads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted fleet hours</td>
<td>450 hours</td>
</tr>
<tr>
<td>Budgeted pounds of fertilizer</td>
<td>24,000,000 pounds</td>
</tr>
<tr>
<td>Budgeted variable manufacturing overhead costs for 600 loads</td>
<td>$75,000</td>
</tr>
</tbody>
</table>

| Actual output units produced and delivered | 630 truckloads |
| Actual fleet hours | 436 hours |
| Actual pounds of fertilizer produced and delivered | 25,200,000 pounds |
| Actual variable manufacturing overhead costs | $76,500 |

8) What is the budgeted variable overhead cost rate per output unit?
A) $120.00  
B) $125.00  
C) $166.67  
D) $175.00  
Answer:  B  
Explanation:  B) $75,000/600 = $125.00  
Diff: 2  
Terms:  total-overhead variance  
Objective:  2  
AACSB:  Analytical skills

9) Standard costing is a costing system that allocates overhead costs on the basis of the standard overhead-cost rates times the standard quantities of the allocation bases allowed for the actual outputs produced.
Answer:  TRUE  
Diff: 1  
Terms:  standard costing  
Objective:  2  
AACSB:  Reflective thinking

10) For calculating the cost of products and services, a standard costing system must track actual costs.
Answer:  FALSE  
Explanation:  For calculating the cost of products and services, a standard costing system does not have to track actual costs.  
Diff: 3  
Terms:  standard costing  
Objective:  2  
AACSB:  Reflective thinking
11) Standard costing is a cost system that allocates overhead costs on the basis of overhead cost rates based on actual overhead costs times the standard quantities of the allocation bases allowed for the actual outputs produced.
Answer: FALSE
Explanation: **Standard costing** is a costing system that traces direct costs to output produced by multiplying the standard prices or rates by the standard quantities of inputs allowed for actual outputs produced.
Diff: 3
Terms: standard costing
Objective: 2
AACSB: Reflective thinking

12) The budget period for variable-overhead costs is typically less than 3 months.
Answer: FALSE
Explanation: The budget period for variable-overhead costs is typically 12 months.
Diff: 1
Terms: total-overhead variance
Objective: 2
AACSB: Reflective thinking

Objective 8.3

1) The variable overhead flexible-budget variance measures the difference between:
A) actual variable overhead costs and the static budget for variable overhead costs
B) actual variable overhead costs and the flexible budget for variable overhead costs
C) the static budget for variable overhead costs and the flexible budget for variable overhead costs
D) None of these answers is correct.
Answer: B
Diff: 2
Terms: variable overhead flexible-budget variance
Objective: 3
AACSB: Reflective thinking

2) A $5,000 unfavorable flexible-budget variance indicates that:
A) the flexible-budget amount exceeded actual variable manufacturing overhead by $5,000
B) the actual variable manufacturing overhead exceeded the flexible-budget amount by $5,000
C) the flexible-budget amount exceeded standard variable manufacturing overhead by $5,000
D) the standard variable manufacturing overhead exceeded the flexible-budget amount by $5,000
Answer: B
Diff: 2
Terms: variable overhead flexible-budget variance
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

Willis Corporation manufactures industrial-sized gas furnaces and uses budgeted machine-hours to allocate variable manufacturing overhead. The following information pertains to the company's manufacturing overhead data:

<table>
<thead>
<tr>
<th>Budgeted output units</th>
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<tbody>
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<td>10,000 hours</td>
</tr>
<tr>
<td>Budgeted variable manufacturing overhead costs for 15,000 units</td>
<td>$322,500</td>
</tr>
</tbody>
</table>

| Actual output units produced | 44,000 units |
| Actual machine-hours used    | 14,400 hours |
| Actual variable manufacturing overhead costs | $484,000 |

3) What is the flexible-budget amount for variable manufacturing overhead?
   A) $330,000
   B) $473,000
   C) $484,000
   D) None of these answers is correct.
   Answer: B
   Explanation: B) 44,000 × ($322,500/30,000) = $473,000
   Diff: 3
   Terms: variable overhead flexible-budget variance
   Objective: 3
   AACSB: Analytical skills

4) What is the flexible-budget variance for variable manufacturing overhead?
   A) $11,000 favorable
   B) $11,000 unfavorable
   C) $8,600 favorable
   D) None of these answers is correct.
   Answer: B
   Explanation: B) $484,000 - [44,000 × ($322,500/30,000)] = $11,000 unfavorable
   Diff: 3
   Terms: variable overhead flexible-budget variance
   Objective: 3
   AACSB: Analytical skills

5) Variable manufacturing overhead costs were ________ for actual output.
   A) higher than expected
   B) the same as expected
   C) lower than expected
   D) indeterminable
   Answer: A
   Diff: 2
   Terms: variable overhead flexible-budget variance
   Objective: 3
   AACSB: Analytical skills
Answer the following questions using the information below:

Christine Corporation manufactures baseball uniforms and uses budgeted machine-hours to allocate variable manufacturing overhead. The following information pertains to the company's manufacturing overhead data:

<table>
<thead>
<tr>
<th>Budgeted output units</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Budgeted machine-hours</td>
<td>15,000 hours</td>
</tr>
<tr>
<td>Budgeted variable manufacturing overhead costs for 20,000 units</td>
<td>$180,000</td>
</tr>
</tbody>
</table>

Actual output units produced
Actual machine-hours used
Actual variable manufacturing overhead costs

6) What is the flexible-budget amount for variable manufacturing overhead?
A) $162,000
B) $171,000
C) $190,000
D) None of these answers is correct.

Answer: A
Explanation: A) 9,000 × ($180,000/10,000) = $162,000
Diff: 3
Terms: variable overhead flexible-budget variance
Objective: 3
AACSB: Analytical skills

7) What is the flexible-budget variance for variable manufacturing overhead?
A) $9,000 favorable
B) $9,000 unfavorable
C) zero
D) None of these answers is correct.

Answer: B
Explanation: B) 9,000 units x 1.5 hours allowed per unit = 13,500 hours allowed
13,500 hours x budgeted rate of $12 per hour = $162,000
Actual variable overhead was $171,000
Flexible-budget variance $9,000 U
Diff: 3
Terms: variable overhead flexible-budget variance
Objective: 3
AACSB: Analytical skills
8) Variable-manufacturing overhead costs were ________ for actual output.
A) higher than expected
B) the same as expected
C) lower than expected
D) indeterminable
Answer: A
Diff: 2
Terms: variable overhead flexible-budget variance
Objective: 3
AACSB: Analytical skills

Answer the following questions using the information below:

Fearless Frank's Fertilizer Farm produces fertilizer and distributes the product by using his tanker trucks. Frank's uses budgeted fleet hours to allocate variable manufacturing overhead. The following information pertains to the company's manufacturing overhead data:

<table>
<thead>
<tr>
<th>Budgeted output units</th>
<th>600 truckloads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted fleet hours</td>
<td>450 hours</td>
</tr>
<tr>
<td>Budgeted pounds of fertilizer</td>
<td>24,000,000 pounds</td>
</tr>
<tr>
<td>Budgeted variable manufacturing overhead costs for 600 loads</td>
<td>$75,000</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Actual output units produced and delivered</th>
<th>630 truckloads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual fleet hours</td>
<td>436 hours</td>
</tr>
<tr>
<td>Actual pounds of fertilizer produced and delivered</td>
<td>25,200,000 pounds</td>
</tr>
<tr>
<td>Actual variable manufacturing overhead costs</td>
<td>$76,500</td>
</tr>
</tbody>
</table>

9) What is the flexible-budget amount for variable manufacturing overhead?
A) $80,000
B) $78,750
C) $75,000
D) $76,500
Answer: B
Explanation: B) 630 × ($75,000/600) = $78,750
Diff: 3
Terms: variable overhead flexible-budget variance
Objective: 3
AACSB: Analytical skills

10) What is the flexible-budget variance for variable manufacturing overhead?
A) $2,250 favorable
B) $2,250 unfavorable
C) zero
D) None of these answers are correct.
Answer: A
Explanation: A) $76,500 - 630 × ($75,000/600)] = $2,250 favorable
Diff: 3
Terms: variable overhead flexible-budget variance
Objective: 3
AACSB: Analytical skills
11) Variable-manufacturing overhead costs were ________ for actual output.
A) higher than expected
B) the same as expected
C) lower than expected
D) indeterminable
Answer: C
Diff: 2
Terms: variable overhead flexible-budget variance
Objective: 3
AACSB: Analytical skills

12) The variable overhead flexible-budget variance can be further subdivided into the:
A) price variance and the efficiency variance
B) static-budget variance and sales-volume variance
C) spending variance and the efficiency variance
D) sales-volume variance and the spending variance
Answer: C
Diff: 1
Terms: variable overhead flexible-budget variance
Objective: 3
AACSB: Reflective thinking

13) An unfavorable variable overhead spending variance indicates that:
A) variable overhead items were not used efficiently
B) the price of variable overhead items was more than budgeted
C) the variable overhead cost-allocation base was not used efficiently
D) the denominator level was not accurately determined
Answer: B
Diff: 2
Terms: variable overhead spending variance
Objective: 3
AACSB: Reflective thinking

14) When machine-hours are used as an overhead cost-allocation base, the most likely cause of a favorable variable overhead spending variance is:
A) excessive machine breakdowns
B) the production scheduler efficiently scheduled jobs
C) a decline in the cost of energy
D) strengthened demand for the product
Answer: C
Diff: 3
Terms: fixed overhead spending variance
Objective: 3
AACSB: Reflective thinking
15) When machine-hours are used as an overhead cost-allocation base and the unexpected purchase of a new machine results in fewer expenditures for machine maintenance, the most likely result would be to report a(n):
   A) favorable variable overhead spending variance
   B) unfavorable variable overhead efficiency variance
   C) favorable fixed overhead flexible-budget variance
   D) unfavorable production-volume variance
   Answer: A
   Diff: 3
   Terms: variable overhead spending variance
   Objective: 3
   AACSB: Analytical skills

16) For variable manufacturing overhead, there is no:
   A) spending variance
   B) efficiency variance
   C) flexible-budget variance
   D) production-volume variance
   Answer: D
   Diff: 2
   Terms: production-volume variance
   Objective: 3
   AACSB: Reflective thinking

Answer the following questions using the information below:

Brown Corporation manufactured 3,000 chairs during June. The following variable overhead data pertain to June:

- Budgeted variable overhead cost per unit: $12.00
- Actual variable manufacturing overhead cost: $33,600
- Flexible-budget amount for variable manufacturing overhead: $36,000
- Variable manufacturing overhead efficiency variance: $720 unfavorable

17) What is the variable overhead flexible-budget variance?
   A) $2,400 favorable
   B) $720 unfavorable
   C) $3,120 favorable
   D) $2,400 unfavorable
   Answer: A
   Explanation: A) $33,600 - $36,000 = $2,400 (F)
   Diff: 2
   Terms: variable overhead flexible-budget variance
   Objective: 3
   AACSB: Analytical skills

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18) What is the variable overhead spending variance?
A) $1,680 unfavorable
B) $2,400 favorable
C) $2,400 unfavorable
D) $3,120 favorable
Answer: D
Explanation: D) $2,400 (F) + $720 (U) = $3,120 (F)
Diff: 2
Terms: variable overhead spending variance
Objective: 3
AACSB: Analytical skills

20) What is the variable overhead spending variance?
A) $420 unfavorable
B) $600 favorable
C) $600 unfavorable
D) $780 favorable
Answer: D
Explanation: D) $600 (F) - $180 (U) = $780 (F)
Diff: 2
Terms: variable overhead spending variance
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

Roberts Corporation manufactured 100,000 buckets during February. The overhead cost-allocation base is $5.00 per machine-hour. The following variable overhead data pertain to February:

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Budgeted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>100,000 units</td>
<td>100,000 units</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>9,800 hours</td>
<td>10,000 hours</td>
</tr>
<tr>
<td>Variable overhead cost per machine-hour</td>
<td>$5.25</td>
<td>$5.00</td>
</tr>
</tbody>
</table>

21) What is the actual variable overhead cost?
   A) $49,000
   B) $50,000
   C) $51,450
   D) None of these answers is correct.
   Answer: C
   Explanation: C) 9,800 mh × $5.25 = $51,450
   Diff: 1
   Terms: total-overhead variance
   Objective: 3
   AACSB: Analytical skills

22) What is the flexible-budget amount?
   A) $49,000
   B) $50,000
   C) $51,450
   D) None of these answers is correct.
   Answer: B
   Explanation: B) 10,000 mh × $5.00 = $50,000
   Diff: 2
   Terms: variable overhead flexible-budget variance
   Objective: 3
   AACSB: Analytical skills

23) What is the variable overhead spending variance?
   A) $1,000 favorable
   B) $1,450 unfavorable
   C) $2,450 unfavorable
   D) None of these answers is correct.
   Answer: C
   Explanation: C) ($5.25 - $5.00) × 9,800 mh = $2,450 unfavorable
   Diff: 2
   Terms: variable overhead spending variance
   Objective: 3
   AACSB: Analytical skills
24) What is the variable overhead efficiency variance?
A) $1,000 favorable
B) $1,450 unfavorable
C) $2,450 unfavorable
D) None of these answers is correct.
Answer: A
Explanation: A) [9,800 - 10,000] × $5.00 = $1,000 favorable
Diff: 2
Terms: variable overhead efficiency variance
Objective: 3
AACSB: Analytical skills

Answer the following questions using the information below:

Roberson Corporation manufactured 30,000 ice chests during September. The overhead cost-allocation base is $11.25 per machine-hour. The following variable overhead data pertain to September:

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Budgeted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>30,000</td>
<td>24,000</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>15,000</td>
<td>10,800</td>
</tr>
<tr>
<td>Variable overhead cost per machine-hour</td>
<td>$11.00</td>
<td>$11.25</td>
</tr>
</tbody>
</table>

25) What is the actual variable overhead cost?
A) $121,500
B) $151,875
C) $165,000
D) $168,750
Answer: C
Explanation: C) 15,000 mh × $11.00 = $165,000
Diff: 1
Terms: total-overhead variance
Objective: 3
AACSB: Analytical skills

26) What is the flexible-budget amount?
A) $121,500
B) $151,875
C) $165,000
D) $168,750
Answer: B
Explanation: B) 30,000 × (10,800/24,000) × $11.25 = $151,875
Diff: 3
Terms: variable overhead flexible-budget variance
Objective: 3
AACSB: Analytical skills
27) What is the variable overhead spending variance?
A) $3,750 favorable
B) $16,875 unfavorable
C) $13,125 unfavorable
D) $30,375 unfavorable
Answer: A
Explanation: A) ($11.00 - $11.25) × 15,000 mh = $3,750 favorable
Diff: 3
Terms: variable overhead spending variance
Objective: 3
AACSB: Analytical skills

28) What is the variable overhead efficiency variance?
A) $3,750 favorable
B) $16,875 unfavorable
C) $13,125 unfavorable
D) $30,375 unfavorable
Answer: B
Explanation: B) [15,000 - (30,000 × 10,800/24,000) mh] × $11.25 = $16,875 unfavorable
Diff: 3
Terms: variable overhead efficiency variance
Objective: 3
AACSB: Analytical skills

Answer the following questions using the information below:

Russo Corporation manufactured 16,000 air conditioners during November. The overhead cost-allocation base is $31.50 per machine-hour. The following variable overhead data pertain to November:

<table>
<thead>
<tr>
<th>Production</th>
<th>Actual</th>
<th>Budgeted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units</td>
<td>16,000</td>
<td>18,000</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>7,875</td>
<td>9,000</td>
</tr>
<tr>
<td>Variable overhead cost per machine-hour</td>
<td>$31.00</td>
<td>$31.50</td>
</tr>
</tbody>
</table>

29) What is the actual variable overhead cost?
A) $244,125
B) $279,000
C) $248,063
D) $250,000
Answer: A
Explanation: A) 7,875 mh × $31.00 = $244,125
Diff: 1
Terms: variable overhead flexible-budget variance
Objective: 3
AACSB: Analytical skills
30) What is the flexible-budget amount?
A) $248,033
B) $252,000
C) $248,000
D) $279,000
Answer: B
Explanation: B) 16,000 × (9,000/18,000) × $31.00 = $252,000
Diff: 3
Terms: variable overhead flexible-budget variance
Objective: 3
AACSB: Analytical skills

31) What is the variable overhead spending variance?
A) $4,500 unfavorable
B) $3,937.50 unfavorable
C) $4,500 favorable
D) $3,937.50 favorable
Answer: D
Explanation: D) ($31.00- $31.50) × 7,875 mh = $3,937.50 favorable
Diff: 3
Terms: variable overhead spending variance
Objective: 3
AACSB: Analytical skills

32) What is the variable overhead efficiency variance?
A) $3,937.50 favorable
B) $3,937.50 unfavorable
C) $4,500 favorable
D) $4,500 unfavorable
Answer: A
Explanation: A) [7,875 - (16,000 × 9,000/18,000) mh] × $31.00 = $3,937.50 favorable
Diff: 3
Terms: variable overhead efficiency variance
Objective: 3
AACSB: Analytical skills

33) What is the total variable overhead variance
A) $7,875 unfavorable
B) $3,937.50 f unfavorable
C) $7,875 favorable
D) $3,937.50 f favorable
Answer: C
Explanation: C) Actual variable overhead - Flexible budgeted variable overhead
(7,875 mh × $31.00) - [16,000 × (9,000/18,000) mh × $31.50]
$244,125 - $252,000 = $7,875 favorable
Diff: 3
Terms: variable overhead flexible-budget variance
Objective: 3
AACSB: Analytical skills
34) The variable overhead efficiency variance is computed ________ and interpreted ________ the direct-cost efficiency variance.
   A) the same as; the same as
   B) the same as; differently than
   C) differently than; the same as
   D) differently than; differently than
   Answer: B
   Diff: 2
Terms: variable overhead efficiency variance
Objective: 3
AACSB: Reflective thinking

35) An unfavorable variable overhead efficiency variance indicates that:
   A) variable overhead items were not used efficiently
   B) the price of variable overhead items was less than budgeted
   C) the variable overhead cost-allocation base was not used efficiently
   D) the denominator level was not accurately determined
   Answer: C
   Diff: 2
Terms: variable overhead efficiency variance
Objective: 3
AACSB: Reflective thinking

36) Variable overhead costs can be managed by:
   A) reducing the consumption of the cost-allocation base
   B) eliminating nonvalue-adding variable costs
   C) planning for appropriate capacity levels
   D) Both A and B are correct.
   Answer: D
   Diff: 2
Terms: total-overhead variance
Objective: 3
AACSB: Reflective thinking

37) When machine-hours are used as a cost-allocation base, the item most likely to contribute to a favorable variable overhead efficiency variance is:
   A) excessive machine breakdowns
   B) the production scheduler's impressive scheduling of machines
   C) a decline in the cost of energy
   D) strengthened demand for the product
   Answer: B
   Diff: 3
Terms: variable overhead efficiency variance
Objective: 3
AACSB: Reflective thinking
38) When machine-hours are used as a cost-allocation base, the item most likely to contribute to an unfavorable variable overhead efficiency variance is:
A) using more machine hours than budgeted
B) workers wastefully using variable overhead items
C) unused capacity
D) more units being produced than planned
Answer: A
Diff: 3
Terms: variable overhead efficiency variance
Objective: 3
AACSB: Reflective thinking

39) When machine-hours are used as an overhead cost-allocation base, a rush order resulting in unplanned overtime that used less-skilled workers on the machines would most likely contribute to reporting a(n):
A) favorable variable overhead spending variance
B) unfavorable variable overhead efficiency variance
C) favorable fixed overhead flexible-budget variance
D) unfavorable production-volume variance
Answer: B
Diff: 3
Terms: variable overhead efficiency variance
Objective: 3
AACSB: Ethical reasoning

40) A favorable variable overhead spending variance can be the result of paying lower prices than budgeted for variable overhead items such as energy.
Answer: TRUE
Diff: 1
Terms: variable overhead spending variance
Objective: 3
AACSB: Reflective thinking

41) The variable overhead efficiency variance is computed in a different way than the efficiency variance for direct-cost items.
Answer: FALSE
Explanation: The variable overhead efficiency variance is computed the same way as the efficiency variance for direct-cost items.
Diff: 1
Terms: variable overhead efficiency variance
Objective: 3
AACSB: Reflective thinking

42) The variable overhead flexible-budget variance measures the difference between the actual variable overhead costs and the flexible-budget variable-overhead costs.
Answer: TRUE
Diff: 1
Terms: variable overhead flexible-budget variance
Objective: 3
AACSB: Reflective thinking
43) The variable overhead efficiency variance measures the efficiency with which the cost-allocation base is used.
Answer: TRUE
Diff: 1
Terms: variable overhead efficiency variance
Objective: 3
AACSB: Reflective thinking

44) The variable overhead efficiency variance can be interpreted the same way as the efficiency variance for direct-cost items.
Answer: FALSE
Explanation: The interpretations are different. The variable overhead efficiency variance focuses on the quantity of allocation-base used, while the efficiency variance for direct-cost items focuses on the quantity of materials and labor-hours used.
Diff: 2
Terms: variable overhead efficiency variance
Objective: 3
AACSB: Reflective thinking

45) An unfavorable variable overhead efficiency variance indicates that the company used more than planned of the cost-allocation base.
Answer: TRUE
Diff: 3
Terms: variable overhead efficiency variance
Objective: 3
AACSB: Ethical reasoning

46) Causes of a favorable variable overhead efficiency variance might include using lower-skilled workers than expected.
Answer: FALSE
Explanation: Possible causes of a favorable variable overhead efficiency variance might include using higher-skilled workers that are more efficient than expected.
Diff: 2
Terms: variable overhead efficiency variance
Objective: 3
AACSB: Reflective thinking

47) If the production planners set the budgeted machine hours standards too tight, one could anticipate there would be a favorable variable overhead efficiency variance.
Answer: FALSE
Explanation: If the production planners set the budgeted machine hours standards too tight, one could anticipate there would be an unfavorable variable overhead efficiency variance.
Diff: 2
Terms: variable overhead efficiency variance
Objective: 3
AACSB: Ethical reasoning
48) Kelly's Pillow Company manufactures pillows. The 2011 operating budget is based on production of 40,000 pillows with 0.5 machine-hour allowed per pillow. Variable manufacturing overhead is anticipated to be $440,000.

Actual production for 2011 was 36,000 pillows using 19,000 machine-hours. Actual variable costs were $20 per machine-hour.

**Required:**
Calculate the variable overhead spending and efficiency variances.
Answer: Budgeted variable overhead per hour = $440,000/(40,000 \times 0.5) machine-hours = $22

Spending variance = ($22 - $20) \times 19,000 = $38,000 favorable

Efficiency variance = \left[19,000 - (40,000 \times 0.5)\right] \times 22 = $22,000 unfavorable

Diff: 3
Terms: variable overhead spending variance, variable overhead efficiency variance
Objective: 3
AACSB: Analytical skills

49) Amy's Weathervane Company manufactures weathervanes. The 2011 operating budget is based on the production of 5,000 weathervanes with 1.25 machine-hour allowed per weathervane. Variable manufacturing overhead is anticipated to be $150,000.

Actual production for 2011 was 5,500 weathervanes using 6,050 machine-hours. Actual variable costs were $23.75 per machine-hour.

**Required:**
Calculate the variable overhead spending and the efficiency variances.
Answer: Budgeted variable overhead per hour = $150,000/(5,000 \times 1.25) machine-hours = $24

Spending variance = ($24 - $23.75) \times 6,050 = $1,512.50 favorable

Efficiency variance = \left[6,050 - (5,500 \times 1.25)\right] \times 24 = $19,800 favorable

Diff: 3
Terms: variable overhead spending variance, variable overhead efficiency variance
Objective: 3
AACSB: Analytical skills
50) Briefly explain the meaning of the variable overhead efficiency variance and the variable overhead spending variance.
Answer: The variable overhead efficiency variance is the difference between actual quantity of the cost-allocation base used and the budgeted amount of the cost allocation base that should have been used to produce the actual output, multiplied by budgeted variable overhead cost per unit of the cost-allocation base. The efficiency variance for variable overhead cost is based on the efficiency with which the cost allocation base was used to make the actual output.

The variable overhead spending variance is the difference between the actual variable overhead cost per unit of the cost-allocation base and the budgeted variable overhead cost per unit of the cost-allocation base, multiplied by actual quantity of the variable overhead cost-allocation base used for actual output. The meaning of this variance hinges on an explanation of why the per unit cost of the allocation base is lower or higher than the amount budgeted. Some explanations might include different-than-budgeted prices for the individual inputs to variable overhead or perhaps more efficient usage of some of the variable overhead items.

Diff: 2
Terms: variable overhead efficiency variance, variable overhead spending variance
Objective: 3
AACSB: Reflective thinking

51) Briefly explain why a favorable variable overhead spending variance may not always be desireable.
Answer: The variable overhead spending variance is the difference between the actual variable overhead cost per unit of the cost-allocation base and the budgeted variable overhead cost per unit of the cost-allocation base, multiplied by the actual quantity of the variable overhead cost-allocation base used for the actual output. If a favorable variable overhead spending variance had been obtained by the managers of the company purchasing low-priced, poor-quality indirect materials, hired less talented supervisors, or performed less machine maintenance there could be negative future consequences. The long-run prospects for the business may suffer as the company ends up putting out a lower quality product, or it may end up having very large equipment repairs as a result of cutting corners in the short term.

Diff: 2
Terms: variable overhead spending variance
Objective: 3
AACSB: Reflective thinking

52) Can the variable overhead efficiency variance
a. be computed the same way as the efficiency variance for direct-cost items?
b. be interpreted the same way as the efficiency variance for direct-cost items? Explain.
Answer:
a. Yes, the variable overhead efficiency variance can be computed the same way as the efficiency variance for direct-cost items.
b. No, the interpretations are different. The variable overhead efficiency variance focuses on the quantity of allocation-base used, while the efficiency variance for direct-cost items focuses on the quantity of materials and labor-hours used.

Diff: 2
Terms: variable overhead efficiency variance
Objective: 3
AACSB: Analytical skills
Objective 8.4

1) When machine-hours are used as an overhead cost-allocation base and annual leasing costs for equipment unexpectedly increase, the most likely result would be to report a(n):
A) unfavorable variable overhead spending variance
B) favorable variable overhead efficiency variance
C) unfavorable fixed overhead flexible-budget variance
D) favorable production-volume variance
Answer: C
Diff: 3
Terms: fixed overhead flexible-budget variance
Objective: 4
AACSB: Analytical skills

2) The amount reported for fixed overhead on the static budget is also reported:
A) as actual fixed costs
B) as allocated fixed overhead
C) on the flexible budget
D) Both B and C are correct.
Answer: C
Diff: 1
Terms: fixed overhead flexible-budget variance
Objective: 4
AACSB: Reflective thinking

3) An unfavorable fixed overhead spending variance indicates that:
A) there was more excess capacity than planned
B) the price of fixed overhead items cost more than budgeted
C) the fixed overhead cost-allocation base was not used efficiently
D) the denominator level was more than planned
Answer: B
Diff: 2
Terms: fixed overhead spending variance
Objective: 4
AACSB: Reflective thinking

4) A favorable fixed overhead spending variance might indicate that:
A) more capacity was used than planned
B) the denominator level was less than planned
C) the fixed overhead cost-allocation base was not used efficiently
D) a plant expansion did not proceed as originally planned
Answer: D
Diff: 3
Terms: fixed overhead spending variance
Objective: 4
AACSB: Reflective thinking
5) For fixed manufacturing overhead, there is no:
A) spending variance
B) efficiency variance
C) flexible-budget variance
D) production-volume variance
Answer: B
Diff: 2
Terms: total-overhead variance
Objective: 4
AACSB: Reflective thinking

Answer the following questions using the information below:

Jenny's Corporation manufactured 25,000 grooming kits for horses during March. The fixed-overhead cost-allocation rate is $20.00 per machine-hour. The following fixed overhead data pertain to March:

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Static Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>25,000 units</td>
<td>24,000 units</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>6,100 hours</td>
<td>6,000 hours</td>
</tr>
<tr>
<td>Fixed overhead costs for March</td>
<td>$123,000</td>
<td>$120,000</td>
</tr>
</tbody>
</table>

6) What is the flexible-budget amount?
A) $120,000
B) $122,000
C) $123,000
D) $125,000
Answer: A
Explanation: A) $120,000, the same lump sum as the static budget
Diff: 2
Terms: total-overhead variance
Objective: 4
AACSB: Analytical skills

7) What is the amount of fixed overhead allocated to production?
A) $120,000
B) $122,000
C) $123,000
D) $125,000
Answer: D
Explanation: D) 25,000 × (6,000/24,000) × $20.00 = $125,000
Diff: 3
Terms: production-volume variance
Objective: 4
AACSB: Analytical skills
8) What is the fixed overhead spending variance?
A) $1,000 unfavorable
B) $2,000 favorable
C) $3,000 unfavorable
D) $5,000 favorable
Answer: C
Explanation: C) $123,000 actual costs - $120,000 budgeted cost = $3,000 unfavorable
Diff: 3
Terms: fixed overhead spending variance
Objective: 4
AACSB: Analytical skills

Answer the following questions using the information below:

Rutch Corporation manufactured 54,000 door jambs during September. The fixed-overhead cost-allocation rate is $50.00 per machine-hour. The following fixed overhead data pertain to September:

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Static Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>54,000 units</td>
<td>60,000 units</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>985 hours</td>
<td>1,150 hours</td>
</tr>
<tr>
<td>Fixed overhead costs for September</td>
<td>$53,400</td>
<td>$57,500</td>
</tr>
</tbody>
</table>

9) What is the flexible-budget amount?
A) $100,000
B) $53,400
C) $57,500
D) $51,750
Answer: C
Explanation: C) $57,500, the same lump sum as the static budget
Diff: 2
Terms: total-overhead variance
Objective: 4
AACSB: Analytical skills

10) What is the amount of fixed overhead allocated to production?
A) $51,750
B) $100,000
C) $53,400
D) $57,500
Answer: A
Explanation: A) Rate for applying budgeted overhead = $57,500/1,150 = $50/hr
54,000 × (1,150/60,000) × 50.00 = $51,750
Diff: 3
Terms: production-volume variance
Objective: 4
AACSB: Analytical skills
11) What is the fixed overhead spending variance?
A) $5,750 unfavorable
B) $5,750 favorable
C) $4,100 favorable
D) $4,100 unfavorable
Answer: C
Explanation: C) $53,400 actual costs - $57,500 budgeted cost = $4,100 favorable
Diff: 3
Terms: fixed overhead spending variance
Objective: 4
AACSB: Analytical skills

Answer the following questions using the information below:

Gus Corporation manufactured 10,000 golf bags during April. The fixed overhead cost-allocation rate is $40.00 per machine-hour. The following fixed overhead data pertain to March:

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Static Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>10,000 units</td>
<td>12,000 units</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>5,100 hours</td>
<td>6,000 hours</td>
</tr>
<tr>
<td>Fixed overhead cost</td>
<td>$244,000</td>
<td>$240,000</td>
</tr>
</tbody>
</table>

12) What is the flexible-budget amount?
A) $200,000
B) $204,000
C) $240,000
D) $244,000
Answer: C
Explanation: C) $240,000, the same lump sum as the static budget
Diff: 2
Terms: total-overhead variance
Objective: 4
AACSB: Analytical skills

13) What is the amount of fixed overhead allocated to production?
A) $200,000
B) $204,000
C) $240,000
D) $244,000
Answer: A
Explanation: A) 10,000 × (6,000/12,000) × $40.00 = $200,000
Diff: 3
Terms: production-volume variance
Objective: 4
AACSB: Analytical skills
14) Fixed overhead is:
A) overallocated by $4,000
B) underallocated by $4,000
C) overallocated by $44,000
D) underallocated by $44,000
Answer: D
Explanation: D) $244,000 - [10,000 \times (6,000/12,000) \times $40.00] = $44,000 underallocated
Diff: 3
Terms: production-volume variance
Objective: 4
AACSB: Analytical skills

15) When machine-hours are used as a cost-allocation base, the item most likely to contribute to a favorable production-volume variance is:
A) an increase in the selling price of the product
B) the purchase of a new manufacturing machine costing considerably less than expected
C) a decline in the cost of energy
D) strengthened demand for the product
Answer: D
Diff: 3
Terms: production-volume variance
Objective: 4
AACSB: Analytical skills

16) When machine-hours are used as a cost-allocation base, the item most likely to contribute to an unfavorable production-volume variance is:
A) a new competitor gaining market share
B) a new manufacturing machine costing considerably more than expected
C) an increase in the cost of energy
D) strengthened demand for the product
Answer: A
Diff: 3
Terms: production-volume variance
Objective: 4
AACSB: Analytical skills

17) Excess capacity is a sign:
A) that capacity should be reduced
B) that capacity may need to be re-evaluated
C) that the company is suffering a significant economic loss
D) of good management decisions
Answer: B
Diff: 2
Terms: production-volume variance
Objective: 4
AACSB: Reflective thinking
18) If the production planners set the budgeted machine hours standards too tight, one could anticipate there would be an unfavorable fixed overhead efficiency variance.

Answer: FALSE

Explanation: There is no efficiency variance for fixed costs because a given lump sum of fixed costs will be unaffected by how efficiently machine-hours are used to produce output in a given budget period.

Diff: 2
Terms: total-overhead variance
Objective: 3, 4
AACSB: Ethical reasoning

19) For fixed overhead costs, the flexible-budget amount is always the same as the static-budget amount.

Answer: TRUE

Diff: 2
Terms: fixed overhead flexible-budget variance
Objective: 4
AACSB: Reflective thinking

20) The fixed overhead flexible-budget variance is the difference between actual fixed overhead costs and the fixed overhead costs in the flexible budget.

Answer: TRUE

Diff: 1
Terms: fixed overhead flexible-budget variance
Objective: 4
AACSB: Reflective thinking

21) Fixed costs may have a spending variance and/or an efficiency variance.

Answer: FALSE

Explanation: There is never an efficiency variance for fixed costs.

Diff: 2
Terms: total-overhead variance
Objective: 4
AACSB: Reflective thinking

22) All unfavorable overhead variances decrease operating income compared to the budget.

Answer: TRUE

Diff: 2
Terms: total-overhead variance
Objective: 4
AACSB: Reflective thinking

23) A favorable fixed overhead flexible-budget variance indicates that actual fixed costs exceeded the lump-sum amount budgeted.

Answer: FALSE

Explanation: A favorable fixed overhead flexible-budget variance indicates that actual fixed costs were less than the lump-sum amount budgeted.

Diff: 1
Terms: fixed overhead flexible-budget variance
Objective: 4
AACSB: Reflective thinking
24) Fixed costs for the period are by definition a lump sum of costs that remain unchanged and therefore the fixed overhead spending variance is always zero.
Answer: FALSE
Explanation: Fixed costs for the period are by definition a lump sum of costs, but they can and do change from the amount that was originally budgeted.
Diff: 2
Terms: fixed overhead spending variance
Objective: 4
AACSB: Reflective thinking

25) The fixed overhead efficiency variance is the difference between actual fixed overhead costs and fixed overhead costs in the flexible budget.
Answer: FALSE
Explanation: The fixed overhead flexible budget variance is the difference between actual fixed overhead costs and fixed overhead costs in the flexible budget. There is never an efficiency variance for fixed costs.
Diff: 2
Terms: fixed overhead flexible-budget variance
Objective: 4
AACSB: Reflective thinking

26) Favorable overhead variances are always recorded with credits in a standard cost system.
Answer: TRUE
Diff: 2
Terms: standard costing, total-overhead variance
Objective: 4
AACSB: Reflective thinking

27) Under activity-based costing, the flexible-budget amount equals the static-budget amount for fixed overhead costs.
Answer: TRUE
Diff: 2
Terms: fixed overhead flexible-budget variance
Objective: 4
AACSB: Reflective thinking

28) Managers should use unitized fixed manufacturing overhead costs for planning and control.
Answer: FALSE
Explanation: Managers should not use unitized fixed manufacturing overhead costs for planning and control, but only for inventory costing purposes.
Diff: 3
Terms: production-volume variance
Objective: 4
AACSB: Reflective thinking
29) For purposes of allocating fixed overhead costs to products, managers may view the fixed overhead costs as if they had a variable-cost behavior pattern.
Answer: TRUE
Diff: 3
Terms: production-volume variance
Objective: 4
AACSB: Reflective thinking

30) McKenna Company manufactured 1,000 units during April with a total overhead budget of $12,400. However, while manufacturing the 1,000 units the microcomputer that contained the month's cost information broke down. With the computer out of commission, the accountant has been unable to complete the variance analysis report. The information missing from the report is lettered in the following set of data:

Variable overhead:
   Standard cost per unit: 0.4 labor hour at $4 per hour
   Actual costs: $2,100 for 376 hours
   Flexible budget: \( a \)
   Total flexible-budget variance: \( b \)
   Variable overhead spending variance: \( c \)
   Variable overhead efficiency variance: \( d \)

Fixed overhead:
   Budgeted costs: \( e \)
   Actual costs: \( f \)
   Flexible-budget variance: $500 favorable

Required:
Compute the missing elements in the report represented by the lettered items.

Answer:
\[
\begin{align*}
a & = 1,000 \times 0.40 \times 4 = 1,600 \\
b & = 2,100 - 1,600 = 500 \text{ unfavorable} \\
c & = 2,100 - (376 \times 4) = 596 \text{ unfavorable} \\
d & = 1,504 - 1,600 = 96 \text{ favorable} \\
e & = 12,400 - 1,600 = 10,800 \\
f & = 10,800 - 500 \text{ favorable} = 10,300 \text{ favorable}
\end{align*}
\]
Diff: 3
Terms: var ovrhd flex-bud/spend varnc, var ovrhd efficiency/fixed ovrhd flex-budget varnc
Objective: 3, 4
AACSB: Analytical skills
31) Everjoice Company makes clocks. The fixed overhead costs for 20X5 total $720,000. The company uses direct labor-hours for fixed overhead allocation and anticipates 240,000 hours during the year for 480,000 units. An equal number of units are budgeted for each month.

During June, 42,000 clocks were produced and $63,000 were spent on fixed overhead.

**Required:**

a. Determine the fixed overhead rate for 20X5 based on units of input.
b. Determine the fixed overhead static-budget variance for June.
c. Determine the production-volume overhead variance for June.

**Answer:**

a. Fixed overhead rate = $720,000/240,000 = $3.00 per hour

b. Fixed overhead static budget variance = $63,000 - ($720,000/12) = $3,000 unfavorable

c. Budgeted fixed overhead rate per output unit = $720,000/480,000 = $1.50

\[
\text{Denominator level in output units} = (40,000 - 42,000) \times 1.50 = 3,000 \text{ favorable}
\]

Diff: 3
Terms: fixed overhead spending variance, production-volume variance
Objective: 4
AACSB: Analytical skills

32) Brown Company makes watches. The fixed overhead costs for 2011 total $324,000. The company uses direct labor-hours for fixed overhead allocation and anticipates 10,800 hours during the year for 540,000 units. An equal number of units are budgeted for each month.

During October, 48,000 watches were produced and $28,000 was spent on fixed overhead.

**Required:**

a. Determine the fixed overhead rate for 2011 based on the units of input.
b. Determine the fixed overhead static-budget variance for October.
c. Determine the production-volume overhead variance for October.

**Answer:**

a. Fixed overhead rate = $324,000/10,800 = $30.00 per hour

b. Fixed overhead static budget variance = $28,000 - ($324,000/12) = $1,000 unfavorable

c. Budgeted fixed overhead rate per output unit = $324,000/540,000 = $0.60

\[
\text{Denominator level in output units} = (45,000 - 48,000) \times 0.60 = 1,800 \text{ favorable}
\]

Diff: 3
Terms: fixed overhead spending variance, production-volume variance
Objective: 4
AACSB: Analytical skills
33) Explain why there is no efficiency variance for fixed manufacturing overhead costs.
Answer: There is no efficiency variance for fixed overhead costs because a given lump sum of fixed costs will be unaffected by how efficiently machine-hours are used to produce output in a given budget period.
Diff: 2
Terms: total-overhead variance
Objective: 4
AACSB: Reflective thinking

34) How is a budgeted fixed overhead cost rate calculated?
Answer: The budgeted fixed overhead cost rate is calculated by dividing the budgeted fixed overhead costs by the denominator level of the cost-allocation base.
Diff: 2
Terms: production-volume variance
Objective: 4
AACSB: Reflective thinking

35) Explain why there is no production-volume variance for variable manufacturing overhead costs.
Answer: There is no production-volume variance for variable overhead costs because the amount of variable overhead allocated is always the same as the flexible-budget amount.
Diff: 2
Terms: production-volume variance, total-overhead variance
Objective: 4
AACSB: Reflective thinking
36) Abby Company has just implemented a new cost accounting system that provides two variances for fixed manufacturing overhead. While the company's managers are familiar with the concept of spending variances, they are unclear as to how to interpret the production-volume overhead variances. Currently, the company has a production capacity of 54,000 units a month, although it generally produces only 46,000 units. However, in any given month the actual production is probably something other than 46,000.

**Required:**

a. Does the production-volume overhead variance measure the difference between the 54,000 and 46,000, or the difference between the 46,000 and the actual monthly production? Explain.

b. What advice can you provide the managers that will help them interpret the production-volume overhead variances?

    **Answer:**
    a. It is the difference between the 46,000 and the actual production level for the period. The difference between the 54,000 and the 46,000 is the unused capacity that was planned for the period. The difference between the 46,000 and the actual level was not planned.
    
    b. When actual outputs are less than the denominator level, the production-volume variance is unfavorable. This is opposite the label given other variances that have a favorable label when costs are less than the budgeted amount; therefore, caution is needed.

The production-volume variance is favorable when actual production exceeds what was planned for the period. This actually provides for a cost per unit amount that was less than budgeted using the planned denominator.

Diff: 3
Terms: production-volume variance
Objective: 4
AACSB: Analytical skills

37) Explain the meaning of a favorable production-volume variance.

    **Answer:** The production-volume variance is favorable when actual production exceeds that which is planned for the period. When this happens, it results in a fixed cost per unit that is less than budgeted amount using the planned production.

    Diff: 3
    Terms: production-volume variance
    Objective: 4
    AACSB: Reflective thinking
38) What are the arguments for prorating a production-volume variance that has been deemed to be material among work-in-process, finished goods, cost and cost of goods sold as opposed to writing it all off to cost of goods sold?
Answer: If variances are always written off to cost of goods sold, a company could set its standards to either increase (for financial reporting purposes) or decrease (for tax purposes) operating incomes. The proration method has the effect of approximating the allocation of fixed costs based on actual costs and actual output so it is not susceptible to the manipulation of operating income based on the choice of the denominator level.
Diff: 3
Terms: production-volume variance
Objective: 4
AACSB: Analytical skills

39) Explain two concerns when interpreting the production-volume variance as a measure of the economic cost of unused capacity.
Answer: The first concern would be the fact that management might have maintained some extra capacity to meet uncertain demand surges that are important to satisfy. If these surges are not occurring in a given year an unfavorable production-volume variance might occur.

The second concern would be to note that this variance only focuses on fixed overhead costs, and ignores the possibility that price decreases might have been necessary to spur the extra demand to make use of any idle capacity.
Diff: 3
Terms: production-volume variance
Objective: 4
AACSB: Reflective thinking

Objective 8.5

1) Variable overhead costs:
A) never have any unused capacity
B) have no production-volume variance
C) allocated are always the same as the flexible-budget amount
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: total-overhead variance
Objective: 5
AACSB: Reflective thinking

2) Fixed overhead costs:
A) never have any unused capacity
B) should be unitized for planning purposes
C) are unaffected by the degree of operating efficiency in a given budget period
D) Both A and B are correct.
Answer: C
Diff: 2
Terms: total-overhead variance
Objective: 5
AACSB: Reflective thinking
3) Fixed overhead costs must be unitized for:
   A) financial reporting purposes
   B) planning purposes
   C) calculating the production-volume variance
   D) Both A and C are correct.
   Answer: D
   Diff: 2
   Terms: production-volume variance
   Objective: 5
   AACSB: Reflective thinking

4) Generally Accepted Accounting Principles require that unitized fixed manufacturing costs be used for:
   A) pricing decisions
   B) costing decisions
   C) external reporting
   D) All of these answers are correct.
   Answer: C
   Diff: 1
   Terms: production-volume variance
   Objective: 5
   AACSB: Reflective thinking

5) A nonfinancial measure of performance evaluation is:
   A) increased sales
   B) reducing distribution costs
   C) energy used per machine-hour
   D) All of these answers are correct.
   Answer: C
   Diff: 2
   Terms: total-overhead variance
   Objective: 5
   AACSB: Reflective thinking

6) Variance information regarding nonmanufacturing costs can be used to:
   A) plan capacity in the service sector
   B) control distribution costs in the retail sector
   C) determine the most profitable services offered by a bank
   D) All of these answers are correct.
   Answer: D
   Diff: 2
   Terms: total-overhead variance
   Objective: 5
   AACSB: Reflective thinking
7) Marshall Company uses a standard cost system. In April, $266,000 of variable manufacturing overhead costs were incurred and the flexible-budget amount for the month was $300,000. Which of the following variable manufacturing overhead entries would have been recorded for March?

A) Accounts Payable Control and other accounts 300,000
   Work-in-Process Control 300,000
B) Variable Manufacturing Overhead Allocated 300,000
   Accounts Payable and other accounts 300,000
C) Work-in-Process Control 266,000
   Accounts Payable Control and other accounts 266,000
D) Variable Manufacturing Overhead Control 266,000
   Accounts Payable Control and other accounts 266,000

Answer: D
Diff: 2
Terms: standard costing
Objective: 5
AACSB: Analytical skills

8) Sanchez Company made the following journal entry:

Variable Manufacturing Overhead Allocated 200,000
Variable Manufacturing Overhead Efficiency Variance 60,000
   Variable Manufacturing Overhead Control 250,000
   Variable Manufacturing Overhead Spending Variance 10,000

A) Sanchez overallocated variable manufacturing overhead.
B) A $10,000 favorable spending variance was recorded.
C) Work-in-Process is currently overstated.
D) This entry may be recorded yearly to provide timely feedback to managers.

Answer: B
Diff: 2
Terms: standard costing, variable overhead spending/efficiency variance
Objective: 5
AACSB: Analytical skills
9) Luke's Football Manufacturing Company reported:
   Actual fixed overhead $400,000
   Fixed manufacturing overhead spending variance $10,000 favorable
   Fixed manufacturing production-volume variance $15,000 unfavorable

   To isolate these variances at the end of the accounting period, John would debit Fixed Manufacturing
   Overhead Allocated for:
   A) $390,000
   B) $395,000
   C) $400,000
   D) $405,000
   Answer: B
   Explanation: B) $400,000 + $10,000 - $15,000 = $395,000
   Diff: 2
   Terms: fixed overhead spending variance, production-volume variance
   Objective: 5
   AACSB: Analytical skills

10) Andy's Basketball Manufacturing Company reported:
    Actual fixed overhead $500,000
    Fixed manufacturing overhead spending variance $30,000 unfavorable
    Fixed manufacturing production-volume variance $20,000 unfavorable

    To isolate these variances at the end of the accounting period, Brandon would:
    A) debit Fixed Manufacturing Overhead Allocated for $500,000
    B) debit Fixed Manufacturing Overhead Spending Variance for $30,000
    C) credit Fixed Manufacturing Production-Volume Variance for $20,000
    D) credit Fixed Manufacturing Control Allocated for $450,000
    Answer: B
    Diff: 2
    Terms: standard costing, fixed overhead spending variance, production-volume variance
    Objective: 5
    AACSB: Analytical skills

11) Teddy Company uses a standard cost system. In May, $234,000 of variable manufacturing overhead
    costs were incurred and the flexible-budget amount for the month was $240,000. Which of the following
    variable manufacturing overhead entries would have been recorded for May?
    A) Accounts Payable Control and other accounts 240,000
       Work-in-Process Control 240,000
    B) Work-in-Process Control 240,000
       Variable Manufacturing Overhead Allocated 240,000
    C) Work-in-Process Control 234,000
       Accounts Payable Control and other accounts 234,000
    D) Accounts Payable Control and other accounts 234,000
       Variable Manufacturing Overhead Control 234,000
    Answer: B
    Diff: 2
    Terms: standard costing
    Objective: 5
    AACSB: Analytical skills
12) Tara Company makes the following journal entry:

Variable Manufacturing Overhead Allocated 200,000
Variable Manufacturing Overhead Efficiency Variance 5,000
Variable Manufacturing Overhead Control 175,000
Variable Manufacturing Overhead Spending Variance 30,000

A) Tara underallocated variable manufacturing overhead.
B) A $30,000 unfavorable spending variance was recorded.
C) Work-in-Process is currently understated.
D) A $25,000 favorable flexible-budget variance was recorded.

Answer: D

Terms: standard costing, variable overhead efficiency/spending variance
Objective: 5
AACSB: Analytical skills

13) Jeremy's Football Manufacturing Company reported:

Actual fixed overhead $500,000
Fixed manufacturing overhead spending variance $30,000 favorable
Fixed manufacturing production-volume variance $20,000 unfavorable

To isolate these variances at the end of the accounting period, Jeremy would debit Fixed Manufacturing Overhead Allocated for:

A) $480,000
B) $490,000
C) $500,000
D) $510,000

Answer: D

Terms: standard costing, fixed overhead spending variance, production-volume variance
Objective: 5
AACSB: Analytical skills

14) Kristin's Basketball Manufacturing Company reported:

Actual fixed overhead $800,000
Fixed manufacturing overhead spending variance $60,000 favorable
Fixed manufacturing production-volume variance $40,000 favorable

To isolate these variances at the end of the accounting period, Kristin would debit:

A) Fixed Manufacturing Overhead Allocated for $900,000
B) Fixed Manufacturing Overhead Spending Variance for $60,000
C) Fixed Manufacturing Production-Volume Variance for $40,000
D) All of these answers are correct.

Answer: A

Terms: standard costing, fixed overhead spending variance, production-volume variance
Objective: 5
AACSB: Analytical skills
Answer the following questions using the information below:

<table>
<thead>
<tr>
<th>Variances</th>
<th>Spending</th>
<th>Efficiency</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable manufacturing overhead</td>
<td>$ 9,000 F</td>
<td>$30,000 U</td>
<td>(B)</td>
</tr>
<tr>
<td>Fixed manufacturing overhead</td>
<td>$20,000 U</td>
<td>(A)</td>
<td>$80,000 U</td>
</tr>
</tbody>
</table>

15) Above is a:
   A) 4-variance analysis
   B) 3-variance analysis
   C) 2-variance analysis
   D) 1-variance analysis
   Answer: A
   Diff: 1
   Terms: total-overhead variance
   Objective: 5
   AACSB: Analytical skills

16) In the above chart, the amounts for (A) and (B), respectively, are:
   A) $21,000 U; $110,000 U
   B) $21,000 U; Zero
   C) Zero; $110,000 U
   D) Zero; Zero
   Answer: D
   Diff: 1
   Terms: total-overhead variance
   Objective: 5
   AACSB: Analytical skills

17) In a 3-variance analysis the spending variance should be:
   A) $ 9,000 F
   B) $20,000 U
   C) $11,000 U
   D) $21,000 U
   Answer: C
   Explanation: C) $9,000 F + $20,000 U = $11,000 U
   Diff: 1
   Terms: total-overhead variance
   Objective: 5
   AACSB: Analytical skills
18) In a 2-variance analysis the flexible-budget variance and the production-volume variance should be ________ , respectively:
A) $11,000 U; $110,000 U
B) $41,000 U; $80,000 U
C) $21,000 U; $100,000 U
D) $121,000 U; Zero
Answer:  B
Explanation:  B) $9,000 F + $20,000 U + $30,000 U = $41,000 U; $80,000 U
Diff: 2
Terms:  total-overhead variance
Objective:  5
AACSB:  Analytical skills

19) In a 1-variance analysis the total overhead variance should be:
A) $41,000 U
B) $121,000 U
C) $242,000 U
D) None of these answers is correct.
Answer:  B
Explanation:  B) $9,000 F + $20,000 U + $30,000 U + $80,000 U = $121,000 U
Diff: 2
Terms:  total-overhead variance
Objective:  5
AACSB:  Analytical skills

20) Both financial and nonfinancial performance measures are key inputs when evaluating the performance of managers.
Answer:  TRUE
Diff: 1
Terms:  total-overhead variance
Objective:  5
AACSB:  Reflective thinking

21) In the journal entry that records overhead variances, the manufacturing overhead allocated accounts are closed.
Answer:  TRUE
Diff: 1
Terms:  standard costing
Objective:  5
AACSB:  Use of Information Technology

22) Variance analysis of fixed nonmanufacturing costs, such as distribution costs, can also be useful when planning for capacity.
Answer:  TRUE
Diff: 1
Terms:  total-overhead variance
Objective:  5
AACSB:  Reflective thinking
23) At the end of the fiscal year, the fixed overhead spending variance is always prorated among work-in-process control, finished goods control, and cost of goods sold on the basis of the fixed overhead allocated to these accounts.
Answer: FALSE
Explanation: At the end of the fiscal year, the fixed overhead spending variance is written off to cost of goods sold if it is immaterial in amount; otherwise it is prorated among work-in-process control, finished goods control, and cost of goods sold on the basis of the fixed overhead allocated to these accounts.
Diff: 1
Terms: fixed overhead spending variance
Objective: 5
AACSB: Reflective thinking

24) Lungren has budgeted construction overhead for August of $260,000 for variable costs and $435,000 for fixed costs. Actual costs for the month totaled $275,000 for variable and $445,000 for fixed. Allocated fixed overhead totaled $440,000. The company tracks each item in an overhead control account before allocations are made to individual jobs. Spending variances for August were $10,000 unfavorable for variable and $10,000 unfavorable for fixed. The production-volume overhead variance was $5,000 favorable.

Required:
a. Make journal entries for the actual costs incurred.
b. Make journal entries to record the variances for August.

Answer:
a. Variable Overhead Control 275,000
   Accounts Payable and other accounts 275,000
To record actual variable construction overhead

Fixed Overhead Control 445,000
   Accumulated Depreciation, etc. 445,000
To record actual fixed construction overhead

b. Variable Overhead Allocated 260,000
   Variable Overhead Spending Variance 10,000
   Variable Overhead Efficiency Variance* 5,000
   Variable Overhead Control 275,000
To record variances for the period
*Arrived at this number by $275,000 - $260,000 - $5,000

Fixed Overhead Allocated 440,000
Fixed Overhead Spending Variance 10,000
   Fixed Overhead Production-Volume Variance 5,000
   Fixed Overhead Control 445,000
To record variances for the period

Diff: 3
Terms: stdrd costing, var ovrhd effjc/spending varnc, fixed ovrhd spending/prod-vol varnc
Objective: 5
AACSB: Analytical skills
25) Different management levels in Bates, Inc., require varying degrees of managerial accounting information. Because of the need to comply with the managers’ requests, four different variances for manufacturing overhead are computed each month. The information for the September overhead expenditures is as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted output units</td>
<td>3,200 units</td>
</tr>
<tr>
<td>Budgeted fixed manufacturing overhead</td>
<td>$20,000</td>
</tr>
<tr>
<td>Budgeted variable manufacturing overhead</td>
<td>$5 per direct labor hour</td>
</tr>
<tr>
<td>Budgeted direct manufacturing labor hours</td>
<td>2 hours per unit</td>
</tr>
<tr>
<td>Fixed manufacturing costs incurred</td>
<td>$26,000</td>
</tr>
<tr>
<td>Direct manufacturing labor hours used</td>
<td>7,200</td>
</tr>
<tr>
<td>Variable manufacturing costs incurred</td>
<td>$35,600</td>
</tr>
<tr>
<td>Actual units manufactured</td>
<td>3,400</td>
</tr>
</tbody>
</table>

**Required:**

a. Compute a 4-variance analysis for the plant controller.
b. Compute a 3-variance analysis for the plant manager.
c. Compute a 2-variance analysis for the corporate controller.
d. Compute the flexible-budget variance for the manufacturing vice president.

**Answer:**

a. **4-variance analysis:**
   - Variable overhead spending variance = $35,600 - (7,200 × $5) = $400 favorable
   - Variable overhead efficiency variance = $5 × (7,200 - 6,800*) = $2,000 unfavorable
     *3,400 units × 2 hours = 6,800 hours
   - Fixed overhead spending variance = $26,000 - $20,000 = $6,000 unfavorable
   - Fixed overhead production-volume variance = $20,000 - (3,400 × 2 × $3.125*) = $1,250 favorable
     *$20,000/(3,200 units × 2 hours) = $3.125

b. **3-variance analysis:**
   - Spending variance = $400 favorable + $6,000 unfavorable = $5,600 unfavorable
   - Efficiency variance = $2,000 unfavorable
   - Production-volume variance = $1,250 favorable

c. **2-variance analysis:**
   - Flexible-budget variance = $400 F + $2,000 U + $6,000 U = $7,600 unfavorable
   - Production-volume variance = $1,250 favorable

d. **1-variance analysis:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Actual</th>
<th>Budget</th>
<th>Variances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed overhead</td>
<td>$26,000</td>
<td>$21,250</td>
<td>$4,750 U</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>35,600</td>
<td>34,000</td>
<td>$1,600 U</td>
</tr>
<tr>
<td>Flexible-budget variance</td>
<td></td>
<td></td>
<td>$6,350 U</td>
</tr>
</tbody>
</table>

*3.125 × 3,400 × 2 = $21,250
**3,400 × 2 × $5 = $34,000
26) The chapter shows that variance analysis of overhead costs can be presented in 4, 3, 2, and 1-variance analysis. Explain what each of the variances presented under each method shows about overhead costs.

Answer: Under the 4-variance analysis, there is a spending variance shown for the variable manufacturing overhead, a spending variance for the fixed overhead component, an efficiency variance for the variable overhead, and a production-volume variance for the fixed overhead. When the firm uses a 3-variance approach, the fixed and variable spending variance is combined into a single variance, while the variable overhead efficiency is still shown separately and the fixed overhead production-volume variance is singled out. In the 2-variance method, the fixed and variable spending variances are combined into one amount along with the variable efficiency, and then the fixed production-volume is shown as a separate variance. The 1-variance method shows the difference between the actual costs incurred and the flexible-budget amount for the output level achieved.

1) The fixed overhead cost variance can be further subdivided into the:
A) price variance and the efficiency variance
B) spending variance and flexible-budget variance
C) production-volume variance and the efficiency variance
D) flexible-budget variance and the production-volume variance

Answer: D

Diff: 3
Terms: total-overhead variance
Objective: 5
AACSB: Reflective thinking
Answer the following questions using the information below:

Jenny's Corporation manufactured 25,000 grooming kits for horses during March. The fixed-overhead cost-allocation rate is $20.00 per machine-hour. The following fixed overhead data pertain to March:

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Static Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>25,000 units</td>
<td>24,000 units</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>6,100 hours</td>
<td>6,000 hours</td>
</tr>
<tr>
<td>Fixed overhead costs for March</td>
<td>$123,000</td>
<td>$120,000</td>
</tr>
</tbody>
</table>

2) What is the fixed overhead production-volume variance?
   A) $1,000 unfavorable
   B) $2,000 favorable
   C) $3,000 unfavorable
   D) $5,000 favorable
   Answer: D
   Explanation: D) $120,000 - [25,000 × (6,000/24,000) × $20.00] = $5,000 favorable
   Diff: 3
   Terms: production-volume variance
   Objective: 6
   AACSB: Analytical skills

Answer the following questions using the information below:

Gus Corporation manufactured 10,000 golf bags during April. The fixed overhead cost-allocation rate is $40.00 per machine-hour. The following fixed overhead data pertain to March:

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Static Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>10,000 units</td>
<td>12,000 units</td>
</tr>
<tr>
<td>Machine-hours</td>
<td>5,100 hours</td>
<td>6,000 hours</td>
</tr>
<tr>
<td>Fixed overhead cost for March</td>
<td>$244,000</td>
<td>$240,000</td>
</tr>
</tbody>
</table>

3) What is the fixed overhead production-volume variance?
   A) $4,000 unfavorable
   B) $36,000 favorable
   C) $40,000 unfavorable
   D) $44,000 unfavorable
   Answer: C
   Explanation: C) $240,000 - [10,000 × (6,000/12,000) × $40.00] = $40,000 unfavorable
   Diff: 3
   Terms: production-volume variance
   Objective: 6
   AACSB: Analytical skills
4) The production-volume variance may also be referred to as the:
A) flexible-budget variance
B) denominator-level variance
C) spending variance
D) efficiency variance
Answer: B
Diff: 1
Terms: denominator level, denominator-level variance
Objective: 6
AACSB: Analytical skills

5) A favorable production-volume variance indicates that the company:
A) has good management
B) has allocated more fixed overhead costs than budgeted
C) has a total economic gain from using excess capacity
D) should increase capacity
Answer: B
Diff: 2
Terms: production-volume variance
Objective: 6
AACSB: Analytical skills

6) An unfavorable production-volume variance of $20,000 indicates that the company has:
A) unused fixed manufacturing overhead capacity
B) overallocated $20,000 of fixed manufacturing overhead costs
C) $20,000 more capacity than needed
D) an economic loss of $20,000 from selling fewer products than planned
Answer: A
Diff: 3
Terms: production-volume variance
Objective: 6
AACSB: Analytical skills

7) An unfavorable production-volume variance:
A) is not a good measure of a lost production opportunity
B) measures the total economic gain or loss due to unused capacity
C) measures the amount of extra fixed costs planned for but not used
D) takes into account the effect of additional revenues due to maintaining higher prices
Answer: C
Diff: 3
Terms: production-volume variance
Objective: 6
AACSB: Reflective thinking
8) The difference between budgeted fixed manufacturing overhead and the fixed manufacturing overhead allocated to actual output units achieved is called the fixed overhead:
   A) efficiency variance
   B) flexible-budget variance
   C) combined-variance analysis
   D) production-volume variance
   Answer: D
   Diff: 1
   Terms: production-volume variance
   Objective: 6
   AACSB: Reflective thinking

9) The production volume variance arises only for fixed costs.
   Answer: TRUE
   Diff: 1
   Terms: production-volume variance
   Objective: 6
   AACSB: Ethical reasoning

10) The production-volume variance arises whenever the actual level of the denominator differs from the level used to calculate the budgeted fixed overhead rate.
    Answer: TRUE
    Diff: 1
    Terms: production-volume variance
    Objective: 6
    AACSB: Reflective thinking

11) The lump sum budgeted for fixed overhead will always be the same amount for the static budget and the flexible budget.
    Answer: TRUE
    Diff: 2
    Terms: fixed overhead flexible-budget variance
    Objective: 6
    AACSB: Reflective thinking

12) A favorable production-volume variance arises when manufacturing capacity planned for is NOT used.
    Answer: FALSE
    Explanation: An unfavorable production-volume variance arises when manufacturing capacity planned for is not used.
    Diff: 1
    Terms: production-volume variance
    Objective: 6
    AACSB: Reflective thinking
13) An unfavorable production-volume variance always infers that management made a bad planning decision regarding the plant capacity.
Answer: FALSE
Explanation: An unfavorable production-volume variance does not always infer that management made a bad planning decision regarding the plant capacity.
Diff: 2
Terms: production-volume variance
Objective: 6
AACSB: Ethical reasoning

14) Explain why sales-volume variance could be helpful to managers.
Answer: The sales-volume variance is comprised of the operating income volume variance and the production volume variance. The sales-volume variance is useful because it helps managers understand the significant changes in contribution margin, which will occur as a result of selling fewer (or more) units than called for by the budgeted level. It assumes that the fixed costs remain at the budgeted level and can be helpful to managers as they perform sensitivity analysis to see the effects of potential changes in sales volume (up or down). Based on this type of information, they could potentially make more informed decisions on pricing and other strategies.
Diff: 3
Terms: total-overhead variance
Objective: 6
AACSB: Reflective thinking

Objective 8.7
Answer the following questions using the information below:

Munoz, Inc., produces a special line of plastic toy racing cars. Munoz, Inc., produces the cars in batches. To manufacture a batch of the cars, Munoz, Inc., must set up the machines and molds. Setup costs are batch-level costs because they are associated with batches rather than individual units of products. A separate Setup Department is responsible for setting up machines and molds for different styles of car.

Setup overhead costs consist of some costs that are variable and some costs that are fixed with respect to the number of setup-hours. The following information pertains to June 2011:

<table>
<thead>
<tr>
<th></th>
<th>Actual Amounts</th>
<th>Static-budget Amounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units produced and sold</td>
<td>15,000</td>
<td>11,250</td>
</tr>
<tr>
<td>Batch size (number of units per batch)</td>
<td>250</td>
<td>225</td>
</tr>
<tr>
<td>Setup-hours per batch</td>
<td>5</td>
<td>5.25</td>
</tr>
<tr>
<td>Variable overhead cost per setup-hour</td>
<td>$40</td>
<td>$38</td>
</tr>
<tr>
<td>Total fixed setup overhead costs</td>
<td>$12,000</td>
<td>$9,975</td>
</tr>
</tbody>
</table>

1) Calculate the efficiency variance for variable setup overhead costs.
   A) $1,900 unfavorable
   B) $600 unfavorable
   C) $1,900 favorable
   D) $600 favorable
   Answer: C
   Explanation: C) \[ \frac{(15,000}{250} \times 5 \] - \[ \frac{(15,000}{225} \times 5.25 \} \times $38 = $1,900 (F) \]
   Diff: 3
   Terms: variable overhead efficiency variance
   Objective: 7
   AACSB: Analytical skills

2) Calculate the spending variance for variable setup overhead costs.
   A) $1,900 unfavorable
   B) $1,900 favorable
   C) $600 unfavorable
   D) $600 favorable
   Answer: C
   Explanation: C) \( (15,000 / 250) \times 5 \times ($38 - $40) = $600 (U) \)
   Diff: 3
   Terms: variable overhead spending variance
   Objective: 7
   AACSB: Analytical skills
3) Calculate the flexible-budget variance for variable setup overhead costs.
   A) $600 favorable
   B) $1,300 favorable
   C) $600 unfavorable
   D) $1,300 unfavorable
   Answer: B
   Explanation: B) $1,900 (F) - $600 (U) = $1,300 (F)
   Diff: 3
   Terms: variable overhead flexible-budget variance
   Objective: 7
   AACSB: Analytical skills

4) Calculate the spending variance for fixed setup overhead costs.
   A) $3,200 unfavorable
   B) $400 unfavorable
   C) $3,600 unfavorable
   D) $400 favorable
   Answer: B
   Explanation: B) $14,000 - $14,400 = $400 (U)
   Diff: 3
   Terms: fixed overhead spending variance
   Objective: 7
   AACSB: Analytical skills

5) Calculate the production-volume variance for fixed setup overhead costs.
   A) $4,666.67 unfavorable
   B) $400 unfavorable
   C) $4,666.67 favorable
   D) $400 favorable
   Answer: C
   Explanation: C) Normal setup hours = (11,250 / 225) × 5.25 = 262.5 hours
   OH rate = $14,000 / 262.5 = $53.33 per setup hour
   [(15,000 / 225) × 5.25 × $53.33] - $14,000 = $4,666.67 favorable
   Diff: 3
   Terms: production-volume variance
   Objective: 7
   AACSB: Analytical skills
Answer the following questions using the information below:

Lukehart Industries, Inc., produces air purifiers. Lukehart, Inc., produces the air purifiers in batches. To manufacture a batch of the purifiers, Lukehart, Inc., must set up the machines and assembly line tooling. Setup costs are batch-level costs because they are associated with batches rather than individual units of products. A separate Setup Department is responsible for setting up machines and tooling for different models of the air purifiers.

Setup overhead costs consist of some costs that are variable and some costs that are fixed with respect to the number of setup-hours. The following information pertains to June 2011:

<table>
<thead>
<tr>
<th></th>
<th>Budget Amounts</th>
<th>Actual Amounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units produced and sold</td>
<td>10,000</td>
<td>9,000</td>
</tr>
<tr>
<td>Batch size (number of units per batch)</td>
<td>400</td>
<td>375</td>
</tr>
<tr>
<td>Setup-hours per batch</td>
<td>6</td>
<td>5.5</td>
</tr>
<tr>
<td>Variable overhead cost per setup-hour</td>
<td>$50</td>
<td>$52</td>
</tr>
<tr>
<td>Total fixed setup overhead costs</td>
<td>$18,000</td>
<td>$17,750</td>
</tr>
</tbody>
</table>

6) Calculate the efficiency variance for variable setup overhead costs.
A) $150 favorable
B) $114 favorable
C) $264 unfavorable
D) $264 favorable
Answer: A
Explanation: A) \( [(9,000/375) \times 5.5] - [(9,000/400) \times 6] \times 50 = $150 \) (F)
Diff: 3
Terms: variable overhead efficiency variance
Objective: 7
AACSB: Analytical skills

7) Calculate the spending variance for variable setup overhead costs.
A) $150 unfavorable
B) $150 favorable
C) $264 unfavorable
D) $264 favorable
Answer: C
Explanation: C) \( (9,000/375) \times 5.5 \times ($50 - $52) = $264 \) (U)
Diff: 3
Terms: variable overhead spending variance
Objective: 7
AACSB: Analytical skills
8) Calculate the flexible-budget variance for variable setup overhead costs.
   A) $114 favorable
   B) $264 favorable
   C) $264 unfavorable
   D) $114 unfavorable
   Answer: D
   Explanation: D) $150 (F) - $264 (U) = $114 (U)
   Diff: 3
   Terms: variable overhead flexible-budget variance
   Objective: 7
   AACSB: Analytical skills

9) Calculate the spending variance for fixed setup overhead costs.
   A) $250 unfavorable
   B) $150 unfavorable
   C) $250 favorable
   D) $150 favorable
   Answer: C
   Diff: 3
   Terms: fixed overhead spending variance
   Objective: 7
   AACSB: Analytical skills

10) Calculate the production-volume variance for fixed setup overhead costs.
    A) $1,800 favorable
    B) $1,800 unfavorable
    C) $250 unfavorable
    D) $250 favorable
    Answer: B
    Explanation: B) Normal setup hours = (10,000 / 400) × 6 = 150 hours
                 OH rate = $18,000 / 150 = $120.00 per setup hour
                 [(9,000 / 400) × 6 × $120] - $18,000 = $1,800 unfavorable
    Diff: 3
    Terms: production-volume variance
    Objective: 7
    AACSB: Analytical skills

11) Fixed and variable cost variances can ________ be applied to activity-based costing systems.
    A) always
    B) most times
    C) seldom
    D) never
    Answer: A
    Diff: 1
    Terms: total-overhead variance
    Objective: 7
    AACSB: Analytical skills
12) Variance analysis of fixed overhead costs is also useful when a company uses activity-based costing.  
Answer: TRUE  
Diff: 1  
Terms: total-overhead variance  
Objective: 7  
AACSB: Reflective thinking

13) A favorable fixed setup overhead spending variance could be due to higher lease costs of new setup equipment.  
Answer: FALSE  
Explanation: An unfavorable fixed setup overhead spending variance could be due to higher lease costs of new setup equipment.  
Diff: 2  
Terms: fixed overhead spending variance  
Objective: 7  
AACSB: Reflective thinking

14) An unfavorable variable setup overhead efficiency variance could be due to actual setup-hours exceeding the setup-hours planned for the units produced.  
Answer: TRUE  
Diff: 2  
Terms: variable overhead efficiency variance  
Objective: 7  
AACSB: Reflective thinking
15) Casey Corporation produces a special line of basketball hoops. Casey Corporation produces the hoops in batches. To manufacture a batch of the basketball hoops, Casey Corporation must set up the machines and molds. Setup costs are batch-level costs because they are associated with batches rather than individual units of products. A separate Setup Department is responsible for setting up machines and molds for different styles of basketball hoops.

Setup overhead costs consist of some costs that are variable and some costs that are fixed with respect to the number of setup-hours. The following information pertains to January 2005.

<table>
<thead>
<tr>
<th></th>
<th>Static-budget Amounts</th>
<th>Actual Amounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basketball hoops produced and sold</td>
<td>30,000</td>
<td>28,000</td>
</tr>
<tr>
<td>Batch size (number of units per batch)</td>
<td>200</td>
<td>250</td>
</tr>
<tr>
<td>Setup-hours per batch</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Variable overhead cost per setup hour</td>
<td>$10</td>
<td>$9</td>
</tr>
<tr>
<td>Total fixed setup overhead costs</td>
<td>$22,500</td>
<td>$21,000</td>
</tr>
</tbody>
</table>

**Required:**

a. Calculate the efficiency variance for variable setup overhead costs.

b. Calculate the spending variance for variable setup overhead costs.

c. Calculate the flexible-budget variance for variable setup overhead costs.

d. Calculate the spending variance for fixed setup overhead costs.

e. Calculate the production-volume variance for fixed setup overhead costs.

**Answer:**

a. \( ((28,000 / 250) \times 4 \times $10) - (28,000 / 200) \times 5 \times $10) = $2,520 \) (F)

b. \( (28,000 / 250) \times 4 \times ($9 - $10) = $448 \) (F)

c. \$2,520 \) (F) + \$448 \) (F) = \$2,968 \) (F)

d. \$22,500 - \$21,000 = \$1,500 \) (F)

e. Normal setup-hours = \( (30,000 / 200) \times 5 = 750 \) hours

   \( \text{OH rate} = \$22,500 / 750 = \$30 \) per setup-hour

   \$22,500 - ((28,000 / 200) \times 5 \times $30) = \$1,500 \) (U)

**Diff:** 3

Terms: variable overhead efficiency/spending var, fixed overhead spending/prod-vol var

Objective: 7

AACSB: Analytical skills
Objective 9.1

1) Which of the following cost(s) are inventoried when using variable costing?
   A) direct manufacturing costs
   B) variable marketing costs
   C) fixed manufacturing costs
   D) Both A and B are correct.
   Answer: A
   Diff: 1
   Terms: variable costing
   Objective: 1
   AACSB: Reflective thinking

2) Which of the following cost(s) are inventoried when using absorption costing?
   A) direct manufacturing costs
   B) variable marketing costs
   C) fixed manufacturing costs
   D) Both A and C are correct.
   Answer: D
   Diff: 1
   Terms: absorption costing
   Objective: 1
   AACSB: Reflective thinking

3) ________ is a method of inventory costing in which all variable manufacturing costs (direct and indirect) are included as inventoriable costs and all fixed manufacturing costs are excluded.
   A) Variable costing
   B) Mixed costing
   C) Absorption costing
   D) Standard costing
   Answer: A
   Diff: 1
   Terms: absorption costing
   Objective: 1
   AACSB: Reflective thinking

4) Absorption costing is required for all of the following except:
   A) generally accepted accounting principles
   B) determining a competitive selling price
   C) external reporting to shareholders
   D) income tax reporting
   Answer: B
   Diff: 2
   Terms: absorption costing
   Objective: 1
   AACSB: Reflective thinking
5) Absorption costing:
A) expenses marketing costs as cost of goods sold
B) treats direct manufacturing costs as a period cost
C) includes fixed manufacturing overhead as an inventoriable cost
D) is required for internal reports to managers
Answer: C
Diff: 3
Terms: absorption costing
Objective: 1
AACSB: Reflective thinking

6) Variable costing:
A) expenses administrative costs as cost of goods sold
B) treats direct manufacturing costs as a product cost
C) includes fixed manufacturing overhead as an inventoriable cost
D) is required for external reporting to shareholders
Answer: B
Diff: 3
Terms: variable costing
Objective: 1
AACSB: Reflective thinking

7) ________ method(s) expense(s) variable marketing costs in the period incurred.
A) Variable costing
B) Absorption costing
C) Throughput costing
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: variable costing, absorption costing, throughput costing
Objective: 1
AACSB: Reflective thinking

8) ________ method(s) include(s) fixed manufacturing overhead costs as inventoriable costs.
A) Variable costing
B) Absorption costing
C) Throughput costing
D) All of these answers are correct.
Answer: B
Diff: 1
Terms: absorption costing
Objective: 1
AACSB: Reflective thinking
9) _______ method(s) expense(s) direct material costs as cost of goods sold.
   A) Variable costing  
   B) Absorption costing  
   C) Throughput costing  
   D) All of these answers are correct.  
   Answer: D  
   Diff: 1  
   Terms: variable costing, absorption costing, throughput costing  
   Objective: 1  
   AACSB: Reflective thinking

10) _______ method(s) is required for tax reporting purposes.  
    A) Variable costing  
    B) Absorption costing  
    C) Throughput costing  
    D) All of these answers are correct.  
    Answer: B  
    Diff: 1  
    Terms: absorption costing  
    Objective: 1  
    AACSB: Reflective thinking

11) _______ is a method of inventory costing in which only variable manufacturing costs are included as inventoriable costs.  
    A) Fixed costing  
    B) Variable costing  
    C) Absorption costing  
    D) Mixed costing  
    Answer: B  
    Diff: 1  
    Terms: variable costing  
    Objective: 1  
    AACSB: Reflective thinking

12) Variable costing regards fixed manufacturing overhead as a(n):  
    A) administrative cost  
    B) inventoriable cost  
    C) period cost  
    D) product cost  
    Answer: C  
    Diff: 1  
    Terms: variable costing  
    Objective: 1  
    AACSB: Reflective thinking
13) The only difference between variable and absorption costing is the expensing of:
A) direct manufacturing costs
B) variable marketing costs
C) fixed manufacturing costs
D) Both A and C are correct.
Answer: C
Diff: 2
Terms: variable costing, absorption costing
Objective: 1
AACSB: Reflective thinking

Answer the following questions using the information below:

Gloria's Decorating produces and sells a mantel clock for $80 per unit. In 2011, 50,000 clocks were produced and 40,000 were sold. Other information for the year includes:

- Direct materials $30.00 per unit
- Direct manufacturing labor $2.00 per unit
- Variable manufacturing costs $3.00 per unit
- Sales commissions $5.00 per part
- Fixed manufacturing costs $25.00 per unit
- Administrative expenses, all fixed $15.00 per unit

14) What is the inventoriable cost per unit using variable costing?
A) $32
B) $35
C) $40
D) $60
Answer: B
Explanation: B) $30.00 + $2.00 + $3.00 = $35.00
Diff: 2
Terms: variable costing
Objective: 1
AACSB: Analytical skills

15) What is the inventoriable cost per unit using absorption costing?
A) $32
B) $35
C) $60
D) $80
Answer: C
Explanation: C) $30 + $2 + $3 + $25 = $60
Diff: 2
Terms: absorption costing
Objective: 1
AACSB: Analytical skills
Answer the following questions using the information below:

Kory's Auto produces and sells an auto part for $60.00 per unit. In 2011, 100,000 parts were produced and 75,000 units were sold. Other information for the year includes:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$24.00 per unit</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>$ 4.50 per unit</td>
</tr>
<tr>
<td>Variable manufacturing costs</td>
<td>$ 1.50 per unit</td>
</tr>
<tr>
<td>Sales commissions</td>
<td>$ 6.00 per part</td>
</tr>
<tr>
<td>Fixed manufacturing costs</td>
<td>$750,000 per year</td>
</tr>
<tr>
<td>Administrative expenses, all fixed</td>
<td>$270,000 per year</td>
</tr>
</tbody>
</table>

16) What is the inventoriable cost per unit using variable costing?
A) $28.50
B) $30.00
C) $36.00
D) $43.50
Answer: B
Explanation: B) $24.00 + $4.50 + $1.50 = $30.00
Diff: 2
Terms: variable costing
Objective: 1
AACSB: Analytical skills

17) What is the inventoriable cost per unit using absorption costing?
A) $30.00
B) $36.00
C) $37.50
D) $43.50
Answer: C
Explanation: C) $24.00 + $4.50 + $1.50 + ($750,000 / 100,000) = $37.50
Diff: 2
Terms: absorption costing
Objective: 1
AACSB: Analytical skills

18) Which of the following inventory costing methods shown below is required by GAAP (Generally Accepted Accounting Principles) for external financial reporting?
A) absorption costing
B) variable costing
C) throughput costing
D) direct costing
Answer: A
Diff: 2
Terms: absorption costing
Objective: 1
AACSB: Reflective thinking
19) The two most common methods of costing inventories in manufacturing companies are variable costing and absorption costing.
Answer: TRUE
Diff: 1
Terms: absorption costing, variable costing
Objective: 1
AACSB: Reflective thinking

20) Absorption costing "absorbs" only fixed manufacturing costs.
Answer: FALSE
Explanation: Absorption costing "absorbs" all manufacturing costs, both fixed and variable.
Diff: 1
Terms: absorption costing
Objective: 1
AACSB: Reflective thinking

21) Variable costing includes all variable costs both manufacturing and nonmanufacturing in inventory.
Answer: FALSE
Explanation: Variable costing includes only manufacturing variable costs in inventory.
Diff: 1
Terms: variable costing
Objective: 1
AACSB: Reflective thinking

22) Under both variable and absorption costing, all variable manufacturing costs are inventoriable costs.
Answer: TRUE
Diff: 1
Terms: variable costing, absorption costing
Objective: 1
AACSB: Reflective thinking

23) The main difference between variable costing and absorption costing is the way in which fixed manufacturing costs are accounted for.
Answer: TRUE
Diff: 1
Terms: absorption costing, variable costing
Objective: 1
AACSB: Reflective thinking

24) Under absorption costing, all variable manufacturing costs and all fixed manufacturing costs are included as inventoriable costs.
Answer: TRUE
Diff: 1
Terms: absorption costing
Objective: 1
AACSB: Reflective thinking
25) For 2011, Nichols, Inc., had sales of 150,000 units and production of 200,000 units. Other information for the year included:

- Direct manufacturing labor $187,500
- Variable manufacturing overhead 100,000
- Direct materials 150,000
- Variable selling expenses 100,000
- Fixed administrative expenses 100,000
- Fixed manufacturing overhead 200,000

There was no beginning inventory.

**Required:**

a. Compute the ending finished goods inventory under both absorption and variable costing.
b. Compute the cost of goods sold under both absorption and variable costing.

**Answer:**

<table>
<thead>
<tr>
<th></th>
<th><strong>Absorption</strong></th>
<th><strong>Variable</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$150,000</td>
<td>$150,000</td>
</tr>
<tr>
<td>Direct manuf. lab</td>
<td>$187,500</td>
<td>$187,500</td>
</tr>
<tr>
<td>Variable manuf.</td>
<td>100,000</td>
<td>100,000</td>
</tr>
<tr>
<td>over.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fixed manuf. over</td>
<td>200,000</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$637,500</strong></td>
<td><strong>$437,500</strong></td>
</tr>
</tbody>
</table>

Unit costs:
- $637,500/200,000 units $3.1875
- $437,500/200,000 units $2.1875

Ending inventory:
- 50,000 units × $3.1875 $159,375
- 50,000 units × $2.1875 $109,375

b. Cost of goods sold:
- 150,000 × $3.1875 $478,125
- 150,000 × $2.1875 $328,125

Diff: 2

Terms: variable costing, absorption costing
Objective: 1
AACSB: Analytical skills
26) Charlassier Corporation manufactures and sells laptop computers and uses standard costing. For the month of September there was no beginning inventory, there were 3,000 units produced and 2,500 units sold. The manufacturing variable cost per unit is $385 and the variable operating cost per unit was $312.50. The fixed manufacturing cost is $450,000 and the fixed operating cost is $75,000. The selling price per unit is $925.

**Required:**
Prepare the income statement for Charlassier Corporation for September under variable costing.

**Answer:**
Revenues (2,500 × $925) $2,312,500

**Variable costs**
Beginning inventory $ 0
Variable manufacturing costs (3,000 × $385) 1,155,000
Cost of goods available 1,155,000
Deduct ending inventory ( 500 × $385) (192,500)
Variable cost of goods sold 962,500
Variable operating costs (2,500 × $312.50) 781,250
Total variable costs 1,743,750

**Contribution margin** 568,750

**Fixed costs**
Fixed manufacturing costs 450,000
Fixed operating costs 75,000
Total fixed costs 525,000

**Operating income** $ 43,750

Diff: 2
Terms: variable costing
Objective: 1
AACSB: Analytical skills

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27) a. Explain the difference between the variable and absorption costing methods.
b. Which method(s) are required for external reporting? For internal reporting?

**Answer:**
a. Absorption costing includes both fixed and variable manufacturing costs as inventoriable costs, whereas variable costing only includes variable manufacturing costs as inventoriable costs.
b. Absorption costing is required for external reporting to shareholders and for income tax reporting. A company may use whichever method it chooses for internal reporting purposes.

Diff: 2
Terms: variable costing, absorption costing
Objective: 1
AACSB: Analytical skills
Objective 9.2

1) The contribution-margin format of the income statement:
A) is used with absorption costing
B) calculates gross margin
C) distinguishes between manufacturing and nonmanufacturing costs
D) is used with variable costing
Answer: D
Diff: 2
Terms: variable costing
Objective: 2
AACSB: Reflective thinking

2) The gross-margin format of the income statement:
A) is used with variable costing
B) is used with absorption costing
C) calculates contribution margin
D) distinguishes variable costs from fixed costs
Answer: B
Diff: 2
Terms: absorption costing
Objective: 2
AACSB: Reflective thinking

3) The contribution-margin format of the income statement:
A) is used with absorption costing
B) highlights the lump sum of fixed manufacturing costs
C) distinguishes manufacturing costs from nonmanufacturing costs
D) calculates gross margin
Answer: B
Diff: 3
Terms: variable costing
Objective: 2
AACSB: Reflective thinking

4) The gross-margin format of the income statement:
A) distinguishes between manufacturing and nonmanufacturing costs
B) distinguishes variable costs from fixed costs
C) is used with variable costing
D) calculates contribution margin
Answer: A
Diff: 3
Terms: absorption costing
Objective: 2
AACSB: Reflective thinking
5) _______ are subtracted from sales to calculate contribution margin.
A) Variable manufacturing costs
B) Variable selling and administrative costs
C) Fixed manufacturing costs
D) Both A and B are correct.
Answer: D
Diff: 2
Terms: variable costing
Objective: 2
AACSB: Reflective thinking

6) _______ are subtracted from sales to calculate gross margin.
A) Variable manufacturing costs
B) Variable selling and administrative costs
C) Fixed manufacturing costs
D) Both A and C are correct.
Answer: D
Diff: 2
Terms: absorption costing
Objective: 2
AACSB: Reflective thinking

Answer the following questions using the information below:

Peggy's Pillows produces and sells a decorative pillow for $75.00 per unit. In the first month of
operation, 2,000 units were produced and 1,750 units were sold. Actual fixed costs are the same as the
amount budgeted for the month. Other information for the month includes:

- Variable manufacturing costs $20.00 per unit
- Variable marketing costs $3.00 per unit
- Fixed manufacturing costs $7.00 per unit
- Administrative expenses, all fixed $15.00 per unit
- Ending inventories:
  - Direct materials -0-
  - WIP -0-
  - Finished goods 250 units

7) What is cost of goods sold per unit using variable costing?
A) $20
B) $23
C) $30
D) $45
Answer: A
Explanation: A) $20, only variable manufacturing costs are included when using variable costing.
Diff: 1
Terms: variable costing
Objective: 2
AACSB: Analytical skills
8) What is cost of goods sold using variable costing?
A) $35,000
B) $40,000
C) $47,250
D) $54,000
Answer: A
Explanation:  A) $20 \times 1,750 \text{ units} = $35,000
Diff: 2
Terms: variable costing
Objective: 2
AACSB: Analytical skills

9) What is contribution margin using variable costing?
A) $96,250
B) $91,000
C) $104,000
D) $110,000
Answer: B
Explanation:  B) $(75 \times 1,750) - [(20 + 3) \times 1,750 \text{ units}] = $91,000
Diff: 3
Terms: variable costing
Objective: 2
AACSB: Analytical skills

10) What is operating income using variable costing?
A) $52,500
B) $78,750
C) $65,750
D) $47,000
Answer: D
Explanation:  D) Contribution margin of $91,000 - [(7 + 15) \times 2,000 \text{ units}] = $47,000
Diff: 3
Terms: variable costing
Objective: 2
AACSB: Analytical skills
Answer the following questions using the information below:

Barry's Hobbies produces and sells a luxury animal pillow for $80.00 per unit. In the first month of operation, 3,000 units were produced and 2,250 units were sold. Actual fixed costs are the same as the amount budgeted for the month. Other information for the month includes:

- Variable manufacturing costs: $38 per unit
- Variable marketing costs: $2 per unit
- Fixed manufacturing costs: $60,000 per month
- Administrative expenses, all fixed: $12,000 per month
- Ending inventories:
  - Direct materials: 0
  - WIP: 0
  - Finished goods: 750 units

11) What is cost of goods sold per unit when using absorption costing?

A) $38  
B) $40  
C) $58  
D) $64  

Answer: C  
Explanation: C) $38 + ($60,000 / 3,000 units) = $58  
Diff: 2  
Terms: absorption costing  
Objective: 2  
AACSB: Analytical skills

12) What is gross margin when using absorption costing?

A) $95,000  
B) $109,500  
C) $154,500  
D) $49,500  

Answer: D  
Explanation: D) [($80 - $38 - ($60,000/3,000))] × 2,250 units = $49,500  
Diff: 2  
Terms: absorption costing  
Objective: 2  
AACSB: Analytical skills
13) What is operating income when using absorption costing?
A) $8,000
B) $33,000
C) ($23,500)
D) $37,500
Answer: B
Explanation: B) \[ \text{gross margin} - \left( \frac{60,000}{3,000} \right) \times 2,250 \text{ units} = \] \$33,000
Terms: absorption costing
Objective: 2
AACSB: Analytical skills

14) An favorable production-volume variance occurs when:
A) the denominator level exceeds production
B) production exceeds the denominator level
C) production exceeds unit sales
D) unit sales exceed production
Answer: B
Terms: practical capacity
Objective: 2
AACSB: Reflective thinking

15) If the unit level of inventory increases during an accounting period, then:
A) less operating income will be reported under absorption costing than variable costing
B) more operating income will be reported under absorption costing than variable costing
C) operating income will be the same under absorption costing and variable costing
D) the exact effect on operating income cannot be determined
Answer: B
Terms: absorption costing
Objective: 2
AACSB: Reflective thinking

16) The difference between operating incomes under variable costing and absorption costing centers on how to account for:
A) direct materials costs
B) fixed manufacturing costs
C) variable manufacturing costs
D) Both B and C are correct.
Answer: B
Terms: variable costing, absorption costing
Objective: 2
AACSB: Reflective thinking
17) One possible means of determining the difference between operating incomes for absorption costing and variable costing is by:
A) subtracting sales of the previous period from sales of this period
B) subtracting fixed manufacturing overhead in beginning inventory from fixed manufacturing overhead in ending inventory
C) multiplying the number of units produced by the budgeted fixed manufacturing cost rate
D) adding fixed manufacturing costs to the production-volume variance
Answer: B
Diff: 3
Terms: variable costing, absorption costing
Objective: 2
AACSB: Reflective thinking

18) When comparing the operating incomes between absorption costing and variable costing, and ending finished inventory exceeds beginning finished inventory, it may be assumed that:
A) sales decreased during the period
B) variable cost per unit is more than fixed cost per unit
C) there is a favorable production-volume variance
D) absorption costing operating income exceeds variable costing operating income
Answer: D
Diff: 3
Terms: variable costing, absorption costing
Objective: 2
AACSB: Reflective thinking

19) Which of the following statements is FALSE?
A) Absorption costing allocates fixed manufacturing overhead to actual units produced during the period.
B) Nonmanufacturing costs are expensed in the future under variable costing.
C) Fixed manufacturing costs in ending inventory are expensed in the future under absorption costing.
D) Operating income under absorption costing is higher than operating income under variable costing when production units exceed sales units.
Answer: B
Diff: 3
Terms: variable costing
Objective: 2
AACSB: Reflective thinking
20) Heston Company has the following information for the current year:

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning fixed manufacturing overhead in inventory</td>
<td>$190,000</td>
</tr>
<tr>
<td>Fixed manufacturing overhead in production</td>
<td>$750,000</td>
</tr>
<tr>
<td>Ending fixed manufacturing overhead in inventory</td>
<td>$50,000</td>
</tr>
<tr>
<td>Beginning variable manufacturing overhead in inventory</td>
<td>$20,000</td>
</tr>
<tr>
<td>Variable manufacturing overhead in production</td>
<td>$100,000</td>
</tr>
<tr>
<td>Ending variable manufacturing overhead in inventory</td>
<td>$30,000</td>
</tr>
</tbody>
</table>

What is the difference between operating incomes under absorption costing and variable costing?

A) $140,000  
B) $100,000  
C) $80,000   
D) $10,000 

Answer:  A  
Explanation:  A) $190,000 - $50,000 = $140,000  
Diff: 3  
Terms:  variable costing, absorption costing  
Objective:  2  
AACSB:  Analytical skills  

21) The following information pertains to Brian Stone Corporation:

<table>
<thead>
<tr>
<th>Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning fixed manufacturing overhead in inventory</td>
<td>$60,000</td>
</tr>
<tr>
<td>Ending fixed manufacturing overhead in inventory</td>
<td>$45,000</td>
</tr>
<tr>
<td>Beginning variable manufacturing overhead in inventory</td>
<td>$30,000</td>
</tr>
<tr>
<td>Ending variable manufacturing overhead in inventory</td>
<td>$14,250</td>
</tr>
<tr>
<td>Fixed selling and administrative costs</td>
<td>$724,000</td>
</tr>
<tr>
<td>Units produced</td>
<td>5,000 units</td>
</tr>
<tr>
<td>Units sold</td>
<td>4,800 units</td>
</tr>
</tbody>
</table>

What is the difference between operating incomes under absorption costing and variable costing?

A) $750  
B) $7,500  
C) $15,000  
D) $30,750 

Answer:  C  
Explanation:  C) $60,000 - $45,000 = $15,000  
Diff: 3  
Terms:  variable costing, absorption costing  
Objective:  2  
AACSB:  Analytical skills
Stiller Corporation incurred fixed manufacturing costs of $12,000 during 2011. Other information for 2011 includes:

- The budgeted denominator level is 2,000 units.
- Units produced total 1,500 units.
- Units sold total 1,200 units.
- Beginning inventory was zero.

The company uses absorption costing and the fixed manufacturing cost rate is based on the budgeted denominator level. Manufacturing variances are closed to cost of goods sold.

22) Fixed manufacturing costs expensed on the income statement (excluding adjustments for variances) total:
A) $7,200
B) $9,600
C) $12,000
D) 0
Answer: A
Explanation: A) $12,000 / 2,000 units = $6 × 1,200 = $7,200
Diff: 3
Terms: absorption costing
Objective: 2
AACSB: Analytical skills

23) Fixed manufacturing costs included in ending inventory total:
A) $2,400
B) $3,000
C) $1,800
D) 0
Answer: C
Explanation: C) $12,000 / 2,000 units = $6 × 300 = $1,800
Diff: 3
Terms: absorption costing
Objective: 2
AACSB: Analytical skills

24) The production-volume variance is:
A) $4,000
B) $3,000
C) $4,800
D) 0
Answer: B
Explanation: B) $12,000 / 2,000 units = $6 × 500 = $3,000
Diff: 3
Terms: absorption costing
Objective: 2
AACSB: Analytical skills
25) Operating income using absorption costing will be _______ than operating income if using variable costing.
A) $4,800 higher
B) $4,800 lower
C) $1,800 higher
D) $7,200 lower
Answer: C
Explanation: C) Different operating incomes are reported because the unit level of inventory increased during the accounting period by 300 units × $6 denominator rate = $1,800. Therefore, operating income is $1,800 higher under absorption costing because $1,800 of fixed manufacturing costs remains in inventory.
Diff: 3
Terms: absorption costing
Objective: 2
AACSB: Analytical skills

Answer the following questions using the information below:

Veach Corporation incurred fixed manufacturing costs of $6,000 during 2011. Other information for 2011 includes:
- The budgeted denominator level is 1,000 units.
- Units produced total 750 units.
- Units sold total 600 units.
- Beginning inventory was zero.

The company uses variable costing and the fixed manufacturing cost rate is based on the budgeted denominator level. Manufacturing variances are closed to cost of goods sold.

26) Fixed manufacturing costs expensed on the income statement (excluding adjustments for variances) total:
A) $3,600
B) $4,800
C) $6,000
D) 0
Answer: C
Explanation: C) $6,000 of fixed manufacturing costs is expensed as a lump sum.
Diff: 3
Terms: variable costing
Objective: 2
AACSB: Analytical skills
27) Fixed manufacturing costs included in ending inventory total:
A) $1,200
B) $1,500
C) $900
D) 0
Answer: D
Explanation: D) Under variable costing no fixed manufacturing costs are included in inventory, and all are expensed on the income statement as a lump sum.
Diff: 3
Terms: variable costing
Objective: 2
AACSB: Analytical skills

28) The production-volume variance totals:
A) $2,000
B) $1,500
C) $2,400
D) 0
Answer: D
Explanation: D) Variable costing has no production-volume variance.
Diff: 3
Terms: variable costing
Objective: 2
AACSB: Analytical skills

29) Operating income using variable costing will be ________ than operating income if using absorption costing.
A) $2,400 higher
B) $2,400 lower
C) $3,600 higher
D) $900 lower
Answer: D
Explanation: D) Different operating incomes are reported because the unit level of inventory increased during the accounting period by 150 units × $6 denominator rate = $900. Therefore, operating income is $900 lower under variable costing because $900 of fixed manufacturing costs remains in inventory under absorption.
Diff: 3
Terms: variable costing, absorption costing
Objective: 2
AACSB: Analytical skills
Answer the following questions using the information below:

Tunney Corporation incurred fixed manufacturing costs of $7,200 during 2011. Other information for 2011 includes:
- The budgeted denominator level is 1,600 units.
- Units produced total 2,000 units.
- Units sold total 1,900 units.
- Beginning inventory was zero.

The fixed manufacturing cost rate is based on the budgeted denominator level. Manufacturing variances are closed to cost of goods sold.

30) Under absorption costing, fixed manufacturing costs expensed on the income statement (excluding adjustments for variances) total:
A) $8,550  
B) $9,000  
C) $7,200  
D) 0  
Answer: A  
Explanation: A) $7,200 / 1,600 units = $4.50 × 1,900 = $8,550  
Diff: 3  
Terms: absorption costing  
Objective: 2  
AACSB: Analytical skills

31) Under absorption costing, the production-volume variance is:
A) $450  
B) $1,350  
C) $1,800  
D) 0  
Answer: C  
Explanation: C) $7,200 / 1,600 units = $4.50 × 400 = $1,800  
Diff: 3  
Terms: absorption costing  
Objective: 2  
AACSB: Analytical skills

32) Under variable costing, the fixed manufacturing costs expensed on the income statement (excluding adjustments for variances) total:
A) $8,550  
B) $7,200  
C) $9,000  
D) 0  
Answer: B  
Explanation: B) $7,200 of fixed manufacturing costs is expensed as a lump sum.  
Diff: 2  
Terms: variable costing  
Objective: 2  
AACSB: Analytical skills
33) Operating income using absorption costing will be ________ operating income if using variable costing.
A) $450 higher than
B) $900 higher than
C) $1,350 lower than
D) the same as
Answer:  A
Explanation:  A) Different operating incomes are reported because the unit level of inventory increased during the accounting period by 100 units × $4.50 denominator rate = $450. Therefore, operating income is $450 higher under absorption costing because $450 of fixed manufacturing costs remains in inventory under absorption costing.
Diff: 3
Terms: absorption costing
Objective:  2
AACSB:  Analytical skills

34) In general, if inventory increases during an accounting period,
A) variable costing will report less operating income than absorption costing.
B) absorption costing will report less operating income than variable costing.
C) variable costing and absorption costing will report the same operating income.
D) None of the above are correct.
Answer:  A
Diff: 3
Terms: absorption costing
Objective:  2
AACSB:  Analytical skills

35) At the end of the accounting period Bumsted Corporation reports operating income of $30,000. If Bumstead's inventory levels decrease during the accounting period
A) variable costing will report less operating income than absorption costing.
B) absorption costing will report less operating income than variable costing.
C) variable costing and absorption costing will report the same operating income.
D) None of the above are correct.
Answer:  B
Diff: 3
Terms: variable costing
Objective:  2
AACSB:  Analytical skills

36) Given a constant contribution margin per unit and constant fixed costs, the period-to-period change in operating income under variable costing is driven solely by:
A) changes in the quantity of units actually sold
B) changes in the quantity of units produced
C) changes in ending inventory
D) changes in sales price per unit
Answer:  A
Diff: 3
Terms: variable costing
Objective:  2
AACSB: Reflective thinking
37) The contribution-margin format of the income statement is used with absorption costing.
Answer: FALSE
Explanation: The contribution-margin format of the income statement is used with variable costing.
Diff: 1
Terms: absorption costing
Objective: 2
AACSB: Reflective thinking

38) The contribution-margin format of the income statement distinguishes manufacturing costs from nonmanufacturing costs.
Answer: FALSE
Explanation: The contribution-margin format of the income statement distinguishes variable costs from fixed costs.
Diff: 1
Terms: variable costing
Objective: 2
AACSB: Reflective thinking

39) The gross-margin format of the income statement highlights the lump sum of fixed manufacturing costs.
Answer: FALSE
Explanation: The gross-margin format of the income statement distinguishes manufacturing costs from nonmanufacturing costs, but it does not highlight the lump sum of fixed manufacturing costs.
Diff: 2
Terms: absorption costing
Objective: 2
AACSB: Reflective thinking

40) In variable costing, all nonmanufacturing costs are subtracted from contribution margin.
Answer: FALSE
Explanation: In variable costing, all fixed costs are subtracted from contribution margin.
Diff: 1
Terms: variable costing
Objective: 2
AACSB: Reflective thinking

41) Direct costing is a perfect way to describe the variable-costing inventory method.
Answer: FALSE
Explanation: Direct costing is a less than perfect way to describe this method because not all variable costs are inventoriable costs.
Diff: 2
Terms: direct costing
Objective: 2
AACSB: Analytical skills
42) When variable costing is used, an income statement will show contribution margin.
Answer: TRUE
Diff: 2
Terms: variable costing
Objective: 2
AACSB: Reflective thinking

43) The income under variable costing will always be the same as the income under absorption costing.
Answer: FALSE
Explanation: The income under variable costing will sometimes be the same as the income under absorption costing.
Diff: 2
Terms: variable costing, absorption costing
Objective: 2
AACSB: Reflective thinking

44) Absorption costing is required by GAAP (Generally Accepted Accounting Principles) for external reporting.
Answer: TRUE
Diff: 2
Terms: absorption costing
Objective: 2
AACSB: Reflective thinking

45) When production deviates from the denominator level, a production-volume variance always exists under absorption costing.
Answer: TRUE
Diff: 1
Terms: absorption costing
Objective: 2
AACSB: Reflective thinking

46) Fixed manufacturing costs included in cost of goods available for sale + the production-volume variance will always = total fixed manufacturing costs under absorption costing.
Answer: TRUE
Diff: 1
Terms: absorption costing
Objective: 2
AACSB: Reflective thinking

47) The production-volume variance only exists under variable costing and not under absorption costing.
Answer: FALSE
Explanation: The production-volume variance only exists under absorption costing and not under variable costing.
Diff: 1
Terms: absorption costing, variable costing
Objective: 2
AACSB: Reflective thinking
48) When the unit level of inventory decreases during an accounting period, operating income is lower under variable costing than absorption costing.
Answer: FALSE
Explanation: Lower operating income is reported under variable costing than absorption costing when the unit level of inventory increases during an accounting period.
Diff: 3
Terms: variable costing, absorption costing
Objective: 2
AACSB: Reflective thinking

49) The difference in operating income under absorption costing and variable costing is due solely to the timing difference of expensing fixed manufacturing costs.
Answer: TRUE
Diff: 2
Terms: variable costing, absorption costing
Objective: 2
AACSB: Reflective thinking

50) If managers report inventories of zero at the start and end of each accounting period, operating incomes under absorption costing and variable costing will be the same.
Answer: TRUE
Diff: 2
Terms: variable costing, absorption costing
Objective: 2
AACSB: Reflective thinking
51) Bressler Company sells its products for $33 each. The current production level is 50,000 units, although only 40,000 units are anticipated to be sold.

Unit manufacturing costs are:
Direct materials $6.00
Direct manufacturing labor $9.00
Variable manufacturing costs $4.50
Total fixed manufacturing costs $180,000
Marketing expenses $3.00 per unit, plus $60,000 per year

Required:

a. Prepare an income statement using absorption costing.
b. Prepare an income statement using variable costing.

Answer:

a. Absorption-costing income statement:

Sales (40,000 × $33) $1,320,000
Cost of goods sold (40,000 × $23.10*) 924,000
Gross margin 396,000
Marketing:
 Variable (40,000 × $3) $120,000
 Fixed 60,000 180,000
Operating income $216,000

* $6.00 + $9.00 + $4.50 + ($180,000/50,000) = $23.10

b. Variable-costing income statement:

Sales (40,000 × $33) $1,320,000
Variable costs:
Cost of goods sold (40,000 × $19.50*) $780,000
Marketing (40,000 × $3) 120,000 900,000
Contribution margin 420,000
Fixed costs:
 Manufacturing $180,000
 Marketing 60,000 240,000
Operating income $180,000

* $6.00 + $9.00 + $4.50 = $19.50

Diff: 2
Terms: variable costing, absorption costing
Objective: 2
AACSB: Analytical skills

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Ireland Corporation planned to be in operation for three years.

- During the first year, 20x1, it had no sales but incurred $240,000 in variable manufacturing expenses and $80,000 in fixed manufacturing expenses.
- In 20x2, it sold half of the finished goods inventory from 20x1 for $200,000 but it had no manufacturing costs.
- In 20x3, it sold the remainder of the inventory for $240,000, had no manufacturing expenses and went out of business.
- Marketing and administrative expenses were fixed and totaled $40,000 each year.

Required:

a. Prepare an income statement for each year using absorption costing.
b. Prepare an income statement for each year using variable costing.

Answer:

a. Absorption-costing income statements:

<table>
<thead>
<tr>
<th></th>
<th>20X1</th>
<th>20X2</th>
<th>20X3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$0</td>
<td>$200,000</td>
<td>$240,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>0</td>
<td>160,000</td>
<td>160,000</td>
</tr>
<tr>
<td>Gross margin</td>
<td>0</td>
<td>40,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Marketing and administrative</td>
<td>40,000</td>
<td>40,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$(40,000)</td>
<td>$0</td>
<td>$40,000</td>
</tr>
</tbody>
</table>

b. Variable-costing income statements:

<table>
<thead>
<tr>
<th></th>
<th>20X1</th>
<th>20X2</th>
<th>20X3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$0</td>
<td>$200,000</td>
<td>$240,000</td>
</tr>
<tr>
<td>Variable expenses</td>
<td>0</td>
<td>120,000</td>
<td>120,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>0</td>
<td>80,000</td>
<td>120,000</td>
</tr>
<tr>
<td>Fixed expenses:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>$80,000</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Marketing and administrative</td>
<td>40,000</td>
<td>40,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Total fixed</td>
<td>120,000</td>
<td>40,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$(120,000)</td>
<td>$40,000</td>
<td>$80,000</td>
</tr>
</tbody>
</table>

Diff: 3
Terms: variable costing, absorption costing
Objective: 2
AACSB: Analytical skills
53) Jarvis Golf Company sells a special putter for $20 each. In March, it sold 28,000 putters while manufacturing 30,000. There was no beginning inventory on March 1. Production information for March was:

- Direct manufacturing labor per unit: 15 minutes
- Fixed selling and administrative costs: $40,000
- Fixed manufacturing overhead: $132,000
- Direct materials cost per unit: $2
- Direct manufacturing labor per hour: $24
- Variable manufacturing overhead per unit: $4
- Variable selling expenses per unit: $2

**Required:**

a. Compute the cost per unit under both absorption and variable costing.
b. Compute the ending inventories under both absorption and variable costing.
c. Compute operating income under both absorption and variable costing.

**Answer:**

- **a.**
  
<table>
<thead>
<tr>
<th></th>
<th>Absorption</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct manufacturing labor ($24/4)</td>
<td>$6.00</td>
<td>$6.00</td>
</tr>
<tr>
<td>Direct materials</td>
<td>2.00</td>
<td>2.00</td>
</tr>
<tr>
<td>Variable manufacturing overhead</td>
<td>4.00</td>
<td>4.00</td>
</tr>
<tr>
<td>Fixed manufacturing overhead ($132,000/30,000)</td>
<td>4.40</td>
<td>0</td>
</tr>
</tbody>
</table>
  
  **Total cost per unit:**
  
<table>
<thead>
<tr>
<th></th>
<th>Absorption</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$16.40</td>
<td>$12.00</td>
</tr>
</tbody>
</table>

- **b.**
  
<table>
<thead>
<tr>
<th></th>
<th>Absorption</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning inventory</td>
<td>$0</td>
<td>$0</td>
</tr>
</tbody>
</table>

  **Cost of goods manufactured:**
  
<table>
<thead>
<tr>
<th></th>
<th>Absorption</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>30,000 × $16.40</td>
<td>$492,000</td>
<td></td>
</tr>
<tr>
<td>30,000 × $12.00</td>
<td>$360,000</td>
<td></td>
</tr>
</tbody>
</table>

  **Cost of goods available for sale:**
  
<table>
<thead>
<tr>
<th></th>
<th>Absorption</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$492,000</td>
<td>$360,000</td>
</tr>
</tbody>
</table>

  **Cost of goods sold:**
  
<table>
<thead>
<tr>
<th></th>
<th>Absorption</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>28,000 × $16.40</td>
<td>$459,200</td>
<td></td>
</tr>
<tr>
<td>28,000 × $12.00</td>
<td>$336,000</td>
<td></td>
</tr>
</tbody>
</table>

  **Ending inventory:**
  
<table>
<thead>
<tr>
<th></th>
<th>Absorption</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$32,800</td>
<td>$24,000</td>
</tr>
</tbody>
</table>
c. Absorption-costing income statement:

Sales (28,000 × $20)  $560,000  
Cost of goods sold (28,000 × $16.40)  459,200  

Gross margin  100,800  
Less:  
  Variable selling and administrative  $56,000  
  Fixed selling and administrative  40,000  

Operating income  $ 4,800  

Variable-costing income statement:

Sales (28,000 × $20)  $560,000  
Variable COGS (28,000 × $12)  336,000  
Variable selling expenses (28,000 × $2)  56,000  

Contribution margin  168,000  
Fixed costs:  
  Manufacturing  $132,000  
  Selling and administrative  40,000  

Operating income  $(4,000)  

Diff: 2  
Terms: variable costing, absorption costing  
Objective: 2  
AACSB: Analytical skills
Johnson Realty bought a 2,000-acre island for $10,000,000 and divided it into 200 equal size lots. As the lots are sold, they are cleared at an average cost of $5,000. Storm drains and driveways are installed at an average cost of $8,000 per site. Sales commissions are 10% of selling price. Administrative costs are $850,000 per year.

The average selling price was $160,000 per lot during 20X5 when 50 lots were sold.

During 20X6, the company bought another 2,000-acre island and developed it exactly the same way. Lot sales in 20X6 totaled 300 with an average selling price of $160,000. All costs were the same as in 20X5.

**Required:** Prepare income statements for both years using both absorption and variable costing methods.

**Answer:**

<table>
<thead>
<tr>
<th>Cost per site:</th>
<th>Absorption</th>
<th>Variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land cost $10,000,000/200 sites</td>
<td>$50,000</td>
<td>$0</td>
</tr>
<tr>
<td>Clearing costs</td>
<td>5,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Improvements</td>
<td>8,000</td>
<td>8,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$63,000</strong></td>
<td><strong>$13,000</strong></td>
</tr>
</tbody>
</table>

**Absorption-costing income statements:**

<table>
<thead>
<tr>
<th></th>
<th>20X5</th>
<th>20X6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$8,000,000</td>
<td>$48,000,000</td>
</tr>
<tr>
<td>Cost of goods sold:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$50 × ($50,000 + $8,000 + $5,000)</td>
<td>3,150,000</td>
<td></td>
</tr>
<tr>
<td>$300 × ($50,000 + $8,000 + $5,000)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross margin</td>
<td>$4,850,000</td>
<td>$29,100,000</td>
</tr>
<tr>
<td>Variable marketing</td>
<td>800,000</td>
<td>4,800,000</td>
</tr>
<tr>
<td>Fixed administrative</td>
<td>850,000</td>
<td>850,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$3,200,000</td>
<td>$23,450,000</td>
</tr>
</tbody>
</table>

**Variable-costing income statements:**

<table>
<thead>
<tr>
<th></th>
<th>20X5</th>
<th>20X6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$8,000,000</td>
<td>$48,000,000</td>
</tr>
<tr>
<td>Variable expenses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost of operations:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>$50 × $13,000</td>
<td>650,000</td>
<td></td>
</tr>
<tr>
<td>$300 × $13,000</td>
<td>3,900,000</td>
<td></td>
</tr>
<tr>
<td>Selling expenses</td>
<td>800,000</td>
<td>4,800,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$6,550,000</td>
<td>$39,300,000</td>
</tr>
<tr>
<td>Fixed expenses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land</td>
<td>10,000,000</td>
<td>10,000,000</td>
</tr>
<tr>
<td>Administrative</td>
<td>850,000</td>
<td>850,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$(4,300,000)</td>
<td>$(28,450,000)</td>
</tr>
</tbody>
</table>

**Diff:** 3

Terms: variable costing, absorption costing
Objective: 2
AACSB: Analytical skills
55) Moore Company prepared the following absorption-costing income statement for the year ended May 31, 2011.

Sales (8,000 units) $160,000  
Cost of goods sold 108,000  
Gross margin $52,000  
Selling and administrative expenses 23,000  
Operating income $ 29,000

Additional information follows:

Selling and administrative expenses include $1.50 of variable cost per unit sold. There was no beginning inventory, and 8,750 units were produced. Variable manufacturing costs were $11 per unit. Actual fixed costs were equal to budgeted fixed costs.

Required:
Prepare a variable-costing income statement for the same period.

Answer:  Sales $160,000

Variable expenses:
- Manufacturing cost of goods sold
  \[ 8,000 \text{ units} \times \$11 = \$88,000 \]
- Selling and administrative
  \[ 8,000 \text{ units} \times \$1.50 = \$12,000 \]

Contribution margin $ 60,000

Fixed expenses:
- Fixed factory overhead
  \[ \frac{108,000}{8,000 \text{ units}} - 11 \times 8,750 \text{ units} = \$21,875 \]
- Fixed selling and administrative
  \[ 23,000 - 12,000 = \$11,000 \]

Operating income $ 27,125

\[1 \quad 8,000 \text{ units} \times \$11 = \$88,000\]  
\[2 \quad 8,000 \text{ units} \times \$1.50 = \$12,000\]  
\[3 \quad \left(108,000/8,000 \text{ units}\right) - 11 \times 8,750 \text{ units} = \$21,875\]  
\[4 \quad 23,000 - 12,000 = \$11,000\]

Diff: 3  
Terms: variable costing  
Objective: 2  
AACSB: Analytical skills
The following data are available for Ruggles Company for the year ended September 30, 2011.

Sales: 24,000 units at $50 each
Expected and actual production: 30,000 units
Manufacturing costs incurred:
  Variable: $525,000
  Fixed: $372,000
Nonmanufacturing costs incurred:
  Variable: $144,800
  Fixed: $77,400
Beginning inventories: none

Required:

a. Determine operating income using the variable-costing approach.
b. Determine operating income using the absorption-costing approach.
c. Explain why operating income is not the same under the two approaches.

Answer:
a. \(24,000 \times 50 = 1,200,000 \text{ sales}\)
\((525,000/30,000) \times 24,000 = 420,000 \text{ variable manufacturing cost}\)
\(1,200,000 - 420,000 = 780,000 \text{ contribution margin}\)
\(780,000 - 144,800 - 77,400 = 557,800 \text{ operating income}\)
b. \((372,000/30,000) \times 24,000 = 297,600 \text{ manufacturing fixed cost}\)
\(1,200,000 - 297,600 = 902,400 \text{ gross margin}\)
\(902,400 - 144,800 - 77,400 = 776,200 \text{ operating income}\)
c. \(260,200 - 185,800 = 74,400 \text{ or 6,000 units in ending inventory} \times 12.40 \text{ per unit of fixed manufacturing cost}\)

Diff: 3
Terms: variable costing, absorption costing
Objective: 2
AACSB: Analytical skills
Davey Jones and Sons Company was concerned that increased sales did not result in increased profits for 2012. Both variable unit and total fixed manufacturing costs for 2011 and 2012 remained constant at $20 and $2,000,000, respectively.

In 2011, the company produced 100,000 units and sold 80,000 units at a price of $50 per unit. There was no beginning inventory in 2011. In 2012, the company made 70,000 units and sold 90,000 units at a price of $50. Selling and administrative expenses were all fixed at $200,000 each year.

Required:

a. Prepare income statements for each year using absorption costing.

b. Prepare income statements for each year using variable costing.

c. Explain why the income was different each year using the two methods. Show computations.

Answer:

a. Absorption-costing income statements:

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$4,000,000</td>
<td>$4,500,000</td>
</tr>
<tr>
<td>Cost of goods sold:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginning inventory</td>
<td>0</td>
<td>800,000</td>
</tr>
<tr>
<td>Variable</td>
<td>2,000,000</td>
<td>1,400,000</td>
</tr>
<tr>
<td>Fixed</td>
<td>2,000,000</td>
<td>2,000,000</td>
</tr>
<tr>
<td>Subtotal</td>
<td>4,000,000</td>
<td>4,200,000</td>
</tr>
<tr>
<td>Ending inventory</td>
<td>800,000</td>
<td>0</td>
</tr>
<tr>
<td>Total COGS</td>
<td>3,200,000</td>
<td>4,200,000</td>
</tr>
<tr>
<td>Gross margin</td>
<td>800,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Selling and administrative</td>
<td>200,000</td>
<td>200,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$ 600,000</td>
<td>$ 100,000</td>
</tr>
</tbody>
</table>

b. Variable-costing income statements:

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$4,000,000</td>
<td>$4,500,000</td>
</tr>
<tr>
<td>Variable expenses</td>
<td>1,600,000</td>
<td>1,800,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>2,400,000</td>
<td>2,700,000</td>
</tr>
<tr>
<td>Fixed expenses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>2,000,000</td>
<td>2,000,000</td>
</tr>
<tr>
<td>Selling and administrative</td>
<td>200,000</td>
<td>200,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$ 200,000</td>
<td>$ 500,000</td>
</tr>
</tbody>
</table>

c. Budgeted fixed manufacturing overhead rate for 2011 = $2,000,000 / 100,000 = $20

2011 difference of $400,000 = (100,000 - 80,000) × $20 = $400,000 (favors absorption method)

2012 difference of $400,000 = (70,000 - 90,000) × $20 = $400,000 (favors variable method)
58) The manager of the manufacturing division of Iowa Windows does not understand why income went down when sales went up. Some of the information he has selected for evaluation include:

<table>
<thead>
<tr>
<th></th>
<th>January</th>
<th>February</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units produced</td>
<td>40,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Units sold</td>
<td>30,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Sales</td>
<td>$600,000</td>
<td>$800,000</td>
</tr>
<tr>
<td>Beginning inventory</td>
<td>0</td>
<td>150,000</td>
</tr>
<tr>
<td>Cost of production</td>
<td>600,000</td>
<td>550,000</td>
</tr>
<tr>
<td>Ending inventory</td>
<td>150,000</td>
<td>0</td>
</tr>
<tr>
<td>Operating income</td>
<td>70,000</td>
<td>35,000</td>
</tr>
</tbody>
</table>

The division operated at normal capacity during January.
Variable manufacturing cost per unit was $5, and the fixed costs were $400,000.
Selling and administrative expenses were all fixed.

**Required:**
Explain the profit differences. How would variable costing income statements help the manager understand the division's operating income?

**Answer:** The 10,000 units in inventory being assigned fixed manufacturing costs cause the operating income difference. The fixed manufacturing cost assigned to the inventory is carried into the next month. The fixed costs per unit were $10 per unit ($400,000/40,000), therefore, $100,000 (10,000 × $10) were carried into February.

Variable costing helps avoid confusion by relating variations in expenses to sales rather than to inventory fluctuations. Under variable costing, the total fixed amount ($400,000) would be expensed in January and none carried forward into February. Therefore, January's income would be $100,000 less than reported and February's $100,000 more than reported.

Diff: 2
Terms: variable costing, absorption costing
Objective: 1, 2
AACSB: Reflective thinking

59) Explain the difference between the gross margin format and the contribution margin format for the income statement. What information is highlighted with each?

**Answer:** The gross margin format divides costs into product and period costs while the contribution format divides costs into variable and fixed costs. The gross margin format highlights cost function while the contribution format highlights cost behavior.

Diff: 2
Terms: variable costing, absorption costing
Objective: 2
AACSB: Reflective thinking

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60) Galliart Company has two identical divisions, East and West. Their sales, production volume, and fixed manufacturing costs have been the same for the last five years. The amounts for each division were as follows:

<table>
<thead>
<tr>
<th></th>
<th>20X1</th>
<th>20X2</th>
<th>20X3</th>
<th>20X4</th>
<th>20X5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units produced</td>
<td>50,000</td>
<td>55,000</td>
<td>55,000</td>
<td>44,000</td>
<td>44,000</td>
</tr>
<tr>
<td>Units sold</td>
<td>45,000</td>
<td>45,000</td>
<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Fixed manufacturing costs</td>
<td>$55,000</td>
<td>$55,000</td>
<td>$55,000</td>
<td>$55,000</td>
<td>$55,000</td>
</tr>
</tbody>
</table>

East Division uses absorption costing and West Division uses variable costing. Both use FIFO inventory methods. Variable manufacturing costs are $5 per unit. Selling and administrative expenses were identical for each division. There were no inventories at the beginning of 20X1.

Which division reports the highest income each year? Explain.
Answer: East Division had the higher income during the first three years because production exceeded sales; this stored some of the fixed manufacturing costs each year in the ending inventory balances. West had the higher income during the last two years because sales exceeded production. During these years, East incurred all of the year's fixed manufacturing costs plus those costs that were in inventory from the prior years.

Diff: 2
Terms: variable costing, absorption costing
Objective: 2
AACSB: Analytical skills

Objective 9.3

1) Companies have recently been able to reduce inventory levels because:
A) there is better sharing of information between suppliers and manufacturers
B) just-in-time production strategies are being implemented
C) production quotas are being implemented
D) Both A and B are correct.
Answer: D
Diff: 2
Terms: absorption costing
Objective: 3
AACSB: Reflective thinking

2) Many companies have switched from absorption costing to variable costing for internal reporting:
A) to comply with external reporting requirements
B) to increase bonuses for managers
C) to reduce the undesirable incentive to build up inventories
D) so the denominator level is more accurate
Answer: C
Diff: 2
Terms: variable costing, absorption costing
Objective: 3
AACSB: Analytical skills
3) Ways to "produce for inventory" that result in increasing operating income include:
A) switching production to products that absorb the least amounts of fixed manufacturing costs
B) delaying items that absorb the greatest amount of fixed manufacturing costs
C) deferring maintenance to accelerate production
D) All of these answers are correct.
Answer: C
Diff: 2
Terms: absorption costing
Objective: 3
AACSB: Reflective thinking

4) Switching production to products that absorb the highest amount of fixed manufacturing costs is also called:
A) cost reduction
B) cherry picking
C) producing for sales
D) throughput costing
Answer: B
Diff: 2
Terms: absorption costing
Objective: 3
AACSB: Reflective thinking

5) To discourage producing for inventory, management can:
A) evaluate nonfinancial measures such as units in ending inventory compared to units in sales
B) evaluate performance over a three- to five-year period rather than a single year
C) incorporate a carrying charge for inventory in the internal accounting system
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: absorption costing
Objective: 3
AACSB: Reflective thinking

6) Which method is NOT a way to discourage producing for inventory?
A) incorporate a carrying charge for inventory
B) focus on careful budgeting and inventory planning
C) include nonfinancial measures when evaluating performance
D) evaluate performance on a quarterly basis only
Answer: D
Diff: 2
Terms: absorption costing
Objective: 3
AACSB: Reflective thinking
7) Under absorption costing, if a manager's bonus is tied to operating income, then increasing inventory levels compared to last year would result in:
A) increasing the manager's bonus
B) decreasing the manager's bonus
C) not affecting the manager's bonus
D) being unable to determine the manager's bonus using only the above information
Answer: A  
Diff: 3  
Terms: absorption costing  
Objective: 3  
AACSB: Reflective thinking

8) Under variable costing, if a manager's bonus is tied to operating income, then increasing inventory levels compared to last year would result in:
A) increasing the manager's bonus
B) decreasing the manager's bonus
C) not affecting the manager's bonus
D) being unable to determine the manager's bonus using only the above information
Answer: C  
Diff: 2  
Terms: variable costing  
Objective: 3  
AACSB: Reflective thinking

9) Critics of absorption costing suggest to evaluate management on their ability to:
A) exceed production quotas
B) increase operating income
C) decrease inventory costs
D) All of these answers are correct.
Answer: C  
Diff: 2  
Terms: absorption costing  
Objective: 3  
AACSB: Reflective thinking

10) Differences between absorption costing and variable costing are much smaller when a:
A) large part of the manufacturing process is subcontracted out
B) just-in-time inventory strategy is implemented
C) significant portion of manufacturing costs are fixed
D) Both A and B are correct.
Answer: D  
Diff: 2  
Terms: variable costing, absorption costing  
Objective: 3  
AACSB: Reflective thinking
11) All of the following are examples of drawbacks of using absorption costing EXCEPT:
A) management has the ability to manipulate operating income via production schedules
B) manipulation of operating income may ultimately increase the company's costs incurred over the long run
C) operating income solely reflects income from the sale of units and excludes the effects of manipulating production schedules
D) decreasing maintenance activities and increasing production result in increased operating income
Answer:  C
Diff: 2
Terms:  absorption costing
Objective:  3
AACSB:  Reflective thinking

12) Which of the following inventory costing methods shown below is most likely to cause undesirable incentives for managers to build up finished goods inventory?
A) absorption costing
B) variable costing
C) throughput costing
D) direct costing
Answer:  A
Diff: 2
Terms:  absorption costing
Objective:  3
AACSB:  Analytical skills

13) Under absorption costing, managers can increase operating income by holding less inventories at the end of the period.
Answer:  FALSE
Explanation: Under absorption costing, managers can increase operating income by holding more inventories at the end of the period.
Diff: 2
Terms:  absorption costing
Objective:  3
AACSB:  Reflective thinking

14) Many companies use variable costing for internal reporting to reduce the undesirable incentive to build up inventories.
Answer:  TRUE
Diff: 2
Terms:  variable costing, absorption costing
Objective:  3
AACSB:  Analytical skills

15) Under absorption costing, managers can increase operating income by producing more inventory at the end of the accounting period.
Answer:  TRUE
Diff: 3
Terms:  variable costing
Objective:  3
AACSB:  Analytical skills
16) Nonfinancial measures such as comparing units in ending inventory this period to units in ending inventory last period can help reduce buildup of excess inventory.
Answer: TRUE
Diff: 1
Terms: absorption costing
Objective: 3
AACSB: Reflective thinking

17) One of the most common problems reported by companies using variable costing is the difficulty of classifying costs into fixed or variable categories.
Answer: TRUE
Diff: 2
Terms: variable costing
Objective: 3
AACSB: Communication

18) Managers can increase operating income when absorption costing is used by producing less inventory.
Answer: FALSE
Explanation: Managers can increase operating income when absorption costing is used by producing more inventory.
Diff: 2
Terms: absorption costing
Objective: 3
AACSB: Reflective thinking

19) A manager can increase operating income by deferring maintenance beyond the current accounting period when absorption costing is used.
Answer: TRUE
Diff: 2
Terms: absorption costing
Objective: 3
AACSB: Reflective thinking
20) Kaiser Company just hired its fourth production manager in three years. All three previous managers had quit because they could not get the company above the break-even point, even though sales had increased somewhat each year. The company was operating at about 60% of plant capacity. The flatware industry was growing, so increased sales were not out of the question.

I. R. Thinking took the job as manager of the production division with a very attractive salary package. After interviewing for the position, he proposed a salary and bonus package that would give him a very small salary but a large bonus if he took the operating income (using absorption costing) above the breakeven point during his very first year.

Required:
What do you think Mr. Thinking had in mind for increasing the company's operating income?
Answer: Mr. Thinking realized that he could probably increase both production and sales during the coming year. If he substantially overproduced he knew that the extra costs would be hidden in unsold inventory. If the new production level could be sold by the sales force in the growing market, the profits would increase anyway and everybody would be happy.

Also, he could combine increased production with reduced fixed manufacturing costs such as maintenance. In the short run, several combinations could be undertaken by Mr. Thinking to ensure that the profit picture would improve.

21) Explain three methods under absorption costing that managers can use to improve operating income.
Answer: 1) A plant manager may switch to manufacturing products that absorb the highest amount of fixed manufacturing costs, regardless of the demand for the product.

2) A plant manager may accept a particular order to increase production, even though another plant in the same company may be better suited to handle the order.

3) To increase production, a manager may defer maintenance beyond the current period.

Terms: absorption costing
Objective: 3
AACSB: Ethical reasoning

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22) Briefly discuss two methods of reducing the undesirable incentives associated with the use of absorption costing to evaluate the performance of a plant manager.
Answer: There are several ways to reduce the undesirable incentives associated with the use of absorption costing to evaluate the performance of a plant manager. Any two of the following would be sufficient to answer this question:

1) Use budgeted balance sheets to limit the ability of a manager to exceed those amounts without providing an explanation.

2) Incorporate a carrying charge for inventory in the internal accounting system. This will serve to reduce the amount of profit a manager reports in proportion to the amount of any inventory buildup.

3) Extend the period of the plant manager's evaluation to a 3 to 5 year period. This will reduce the manager's incentive to produce into the inventory to increase quarterly or short run profits.

4) Include non-financial as well as financial measures in the manager's performance evaluation. These might include ratios of units produced to units sold to make producing to inventory more visible to top management.

Terms: absorption costing
Objective: 3
AACSB: Reflective thinking

Objective 9.4

1) Throughput costing is also called:
A) absorption costing
B) super-variable costing
C) mixed costing
D) direct costing
Answer: B
Diff: 2
Terms: throughput costing, super-variable costing
Objective: 4
AACSB: Reflective thinking

2) Advocates of throughput costing argue that:
A) only direct materials are truly variable
B) direct manufacturing labor is relatively fixed
C) variable manufacturing costs are a cost of the period
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: throughput costing
Objective: 4
AACSB: Reflective thinking
3) Variable and absorption costing may be combined with all costing systems EXCEPT:
A) mixed costing
B) actual costing
C) normal costing
D) standard costing
Answer: A
Diff: 2
Terms: absorption costing, variable costing
Objective: 4
AACSB: Reflective thinking

4) Throughput contribution equals:
A) variable costs minus fixed costs
B) revenues minus all direct labor costs
C) revenues minus all direct material cost of goods sold
D) revenues minus manufacturing overhead
Answer: C
Diff: 2
Terms: throughput contribution
Objective: 4
AACSB: Reflective thinking

5) If 1,000 units are produced and only 700 units are sold, ________ results in the greatest amount of expense reported on the income statement.
A) throughput costing
B) variable costing
C) absorption costing
D) period costing
Answer: A
Diff: 2
Terms: throughput costing
Objective: 4
AACSB: Reflective thinking

6) If 800 units are produced and 1,200 units are sold, ________ results in the greatest amount of operating income.
A) throughput costing
B) variable costing
C) absorption costing
D) period costing
Answer: A
Diff: 2
Terms: throughput costing
Objective: 4
AACSB: Reflective thinking
7) Advocates of throughput costing maintain that:
A) both variable and fixed are necessary to produce goods; therefore, both types of costs should be inventoried
B) all manufacturing costs plus some design costs should be inventoried
C) fixed manufacturing costs are related to the capacity to produce rather than to the actual production of specific units
D) Both A and C are correct.
Answer: C
Diff: 3
Terms: throughput costing
Objective: 4
AACSB: Reflective thinking

Answer the following questions using the information below:

Russert Company produces wood statues. Management has provided the following information:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual sales</td>
<td>30,000 statues</td>
</tr>
<tr>
<td>Budgeted production</td>
<td>50,000 statues</td>
</tr>
<tr>
<td>Selling price</td>
<td>$20.00 per statue</td>
</tr>
<tr>
<td>Direct material costs</td>
<td>$5.00 per statue</td>
</tr>
<tr>
<td>Variable manufacturing costs</td>
<td>$1.50 per statue</td>
</tr>
<tr>
<td>Variable administrative costs</td>
<td>$2.50 per statue</td>
</tr>
<tr>
<td>Fixed manufacturing overhead</td>
<td>$2.00 per statue</td>
</tr>
</tbody>
</table>

8) What is the cost per statue if throughput costing is used?
A) $11.00
B) $9.50
C) $7.50
D) $5.00
Answer: D
Explanation: D) Equal to direct materials = $5.00
Diff: 2
Terms: throughput costing
Objective: 4
AACSB: Analytical skills

9) What is the total throughput contribution?
A) $1,000,000
B) $2,000,000
C) $450,000
D) $750,000
Answer: C
Diff: 3
Terms: throughput costing
Objective: 4
AACSB: Analytical skills
Goldfarb Company produces a specialty item. Management has provided the following information:

- Actual sales: 110,000 units
- Budgeted production: 100,000 units
- Selling price: $40.00 per unit
- Direct material costs: $10.00 per unit
- Variable manufacturing overhead: $3.00 per unit
- Variable administrative costs: $5.00 per unit
- Fixed manufacturing overhead: $4.00 per unit

10) What is the cost per statue if throughput costing is used?
   A) $22.00
   B) $19.00
   C) $15.00
   D) $10.00
   Answer: D
   Explanation: D) Direct material cost of $10
   Diff: 1
   Terms: throughput costing
   Objective: 4
   AACSB: Analytical skills

11) What is the total throughput contribution?
   A) $2,750,000
   B) $2,970,000
   C) $2,530,000
   D) $3,300,000
   Answer: D
   Explanation: D) 110,000 × ($40.00 - $10.00) = $3,300,000
   Diff: 3
   Terms: throughput costing
   Objective: 4
   AACSB: Analytical skills

12) Which of the following inventory costing methods results in the LEAST amount of costs being inventoried?
   A) absorption costing
   B) variable costing
   C) throughput costing
   D) direct costing
   Answer: C
   Diff: 2
   Terms: throughput costing
   Objective: 4
   AACSB: Reflective thinking
13) Which of the following inventory costing methods shown below is LEAST likely to cause undesirable incentives for managers to build up finished goods inventory?
A) absorption costing
B) variable costing
C) throughput costing
D) direct costing
Answer: C
Diff: 2
Terms: throughput costing
Objective: 4
AACSB: Reflective thinking

14) Throughput costing considers only direct materials and direct manufacturing labor to be truly variable costs.
Answer: FALSE
Explanation: Throughput costing considers only direct materials to be truly variable costs.
Diff: 1
Terms: throughput costing
Objective: 4
AACSB: Reflective thinking

15) Throughput costing is also referred to as super-variable costing.
Answer: TRUE
Diff: 1
Terms: throughput costing, super-variable costing
Objective: 4
AACSB: Reflective thinking

16) When production quantity exceeds sales, throughput costing results in reporting lower operating income than variable costing.
Answer: TRUE
Diff: 3
Terms: throughput costing, variable costing
Objective: 4
AACSB: Reflective thinking

17) Throughput costing provides more incentive to produce for inventory than either variable costing or, especially, absorption costing.
Answer: TRUE
Diff: 1
Terms: throughput costing, absorption costing
Objective: 4
AACSB: Reflective thinking
18) A company may use absorption costing for external reports and still choose to use throughput costing for internal reports.
Answer: TRUE
Diff: 2
Terms: throughput costing, absorption costing
Objective: 4
AACSB: Reflective thinking

19) Throughput margin equals revenues minus all product costs.
Answer: FALSE
Explanation: Throughput margin equals revenues minus all direct material cost of the goods sold.
Diff: 1
Terms: throughput costing
Objective: 4
AACSB: Reflective thinking

20) Throughput costing results in a higher amount of manufacturing costs being placed in inventory than either variable or absorption costing.
Answer: FALSE
Explanation: Throughput costing results in a lower amount of manufacturing costs being placed in inventory than either variable or absorption costing.
Diff: 2
Terms: throughput costing
Objective: 4
AACSB: Reflective thinking
21) Klein Enterprises produces a specialty statue item. The following information has been provided by management:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual sales</td>
<td>300,000 units</td>
</tr>
<tr>
<td>Budgeted production</td>
<td>320,000 units</td>
</tr>
<tr>
<td>Selling price</td>
<td>$34 per unit</td>
</tr>
<tr>
<td>Direct manufacturing costs</td>
<td>$9 per unit</td>
</tr>
<tr>
<td>Fixed manufacturing costs</td>
<td>$5 per unit</td>
</tr>
<tr>
<td>Variable manufacturing costs</td>
<td>$4 per unit</td>
</tr>
<tr>
<td>Variable administrative costs</td>
<td>$2 per unit</td>
</tr>
</tbody>
</table>

**Required:**

a. What is the cost per statue if absorption costing is used?
   
   Answer: $9 + $5 + $4 = $18

b. What is the cost per statue if "super-variable costing" is used?
   
   Answer: Equal to direct materials = $9

c. What is the total throughput contribution?
   
   Answer: $9 + $5 + $4 = $18

22) What is throughput costing? What advantages is it purported to have over variable and absorption costing?

Answer: Throughput costing treats all costs except direct materials as costs of the period in which they are incurred. Throughput costing results in a lower amount of manufacturing cost put into inventory than either variable or absorption costing. Supporters of throughput costing claim that it provides less incentive to produce for inventory than absorption costing or even variable costing.

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Objective 9.5

1) Practical capacity is the denominator-level concept that:
A) reduces theoretical capacity for unavoidable operating interruptions
B) is the maximum level of operations at maximum efficiency
C) is based on the level of capacity utilization that satisfies average customer demand over periods generally longer than one year
D) is based on anticipated levels of capacity utilization for the coming budget period
Answer: A
Diff: 1
Terms: practical capacity
Objective: 5
AACSB: Reflective thinking

2) ________ reduces theoretical capacity for unavoidable operating interruptions.
A) Practical capacity
B) Theoretical capacity
C) Master-budget capacity utilization
D) Normal capacity utilization
Answer: A
Diff: 1
Terms: practical capacity
Objective: 5
AACSB: Reflective thinking

3) ________ is based on the level of capacity utilization that satisfies average customer demand over periods generally longer than one year.
A) Practical capacity
B) Theoretical capacity
C) Master-budget capacity utilization
D) Normal capacity utilization
Answer: D
Diff: 1
Terms: normal capacity utilization
Objective: 5
AACSB: Reflective thinking

4) ________ is (are) based on the demand for the output of the plant.
A) Practical capacity
B) Master-budget capacity utilization
C) Normal capacity utilization
D) Both B and C are correct.
Answer: D
Diff: 2
Terms: normal capacity utilization, master-budget capacity utilization
Objective: 5
AACSB: Reflective thinking
5) ________ is the level of capacity based on producing at full efficiency all the time.
A) Practical capacity  
B) Theoretical capacity  
C) Normal capacity  
D) Demand capacity  
Answer: B  
Diff: 2  
Terms: theoretical capacity  
Objective: 5  
AACSB: Reflective thinking

6) Theoretical capacity allows for:  
A) preventive machine maintenance  
B) interruptions due to uncontrollable power failures  
C) rework of the expected number of defective units  
D) None of these answers is correct.  
Answer: D  
Diff: 2  
Terms: theoretical capacity  
Objective: 5  
AACSB: Reflective thinking

7) Theoretical capacity:  
A) is unattainable in the real world  
B) represents an ideal goal of capacity usage  
C) is based on engineering studies that provide information about the technical capabilities of machines used in production  
D) All of these answers are correct.  
Answer: D  
Diff: 2  
Terms: theoretical capacity  
Objective: 5  
AACSB: Reflective thinking

8) The budgeted fixed manufacturing cost rate is the lowest for:  
A) practical capacity  
B) theoretical capacity  
C) master-budget capacity utilization  
D) normal capacity utilization  
Answer: B  
Diff: 2  
Terms: theoretical capacity  
Objective: 5  
AACSB: Reflective thinking
9) ________ provides the lowest estimate of denominator-level capacity.
   A) Practical capacity
   B) Theoretical capacity
   C) Master-budget capacity utilization
   D) Normal capacity utilization
   Answer:  C
   Diff:  2
   Terms:  master-budget capacity utilization
   Objective:  5
   AACSB:  Reflective thinking

10) ________ is the level of capacity utilization that satisfies average customer demand over a period
    that includes seasonal, cyclical, and trend factors.
    A) Normal capacity utilization
    B) Theoretical capacity
    C) Master-budget capacity utilization
    D) Practical capacity
    Answer:  A
    Diff:  2
    Terms:  normal capacity utilization
    Objective:  5
    AACSB:  Reflective thinking

Answer the following questions using the information below:

A manufacturing firm is able to produce 2,000 pairs of sneakers per hour, at maximum efficiency. There
are three eight-hour shifts each day. Due to unavoidable operating interruptions, production averages
1,600 units per hour. The plant actually operates only 27 days per month.

11) What is the theoretical capacity for the month of April?
    A) 2,000,000 units
    B) 1,440,000 units
    C) 1,036,800 units
    D) 480,000 units
    Answer:  B
    Explanation:  B) 2,000 units × 24 hours × 30 days = 1,440,000 units
    Diff:  2
    Terms:  theoretical capacity
    Objective:  5
    AACSB:  Analytical skills
12) What is the practical capacity for the month of April?
A) 2,000,000 units  
B) 1,440,000 units  
C) 1,036,800 units  
D) 480,000 units  
Answer: C  
Explanation: C) 1600 units \times 24 \text{ hours} \times 27 \text{ days} = 1,036,800 \text{ units}  
Diff: 2  
Terms: practical capacity  
Objective: 5  
AACSB: Analytical skills

13) Determining the "right" level of capacity is one of the most strategic and difficult decisions managers face.  
Answer: TRUE  
Diff: 2  
Terms: practical capacity  
Objective: 5  
AACSB: Ethical reasoning

14) Both theoretical and practical capacity measure capacity in terms of demand for the output.  
Answer: FALSE  
Explanation: Both theoretical and practical capacity measure capacity in terms of what a plant can supply available capacity.  
Diff: 2  
Terms: theoretical capacity, practical capacity  
Objective: 5  
AACSB: Reflective thinking

15) Normal capacity utilization is the expected level of capacity utilization for the current budget period, which is typically one year.  
Answer: FALSE  
Explanation: Master-budget capacity utilization is the expected level of capacity utilization for the current budget period, which is typically one year.  
Diff: 1  
Terms: normal capacity utilization  
Objective: 5  
AACSB: Reflective thinking

16) Normal capacity utilization is NOT the same as master-budget capacity utilization.  
Answer: TRUE  
Diff: 1  
Terms: normal capacity utilization, master-budget capacity utilization  
Objective: 5  
AACSB: Reflective thinking
17) Theoretical capacity is the level of capacity based on producing at full efficiency all the time.
Answer: TRUE
Diff: 1
Terms: theoretical capacity
Objective: 5
AACSB: Reflective thinking

18) Theoretical capacity allows time for regular machine maintenance.
Answer: FALSE
Explanation: Theoretical capacity is the denominator-level concept that is based on producing at full efficiency all the time.
Diff: 2
Terms: theoretical capacity
Objective: 5
AACSB: Reflective thinking

19) Practical capacity is the level of capacity that reduces theoretical capacity by considering unavoidable operating interruptions, such as scheduled maintenance time, shutdowns for holidays, and so on.
Answer: TRUE
Diff: 2
Terms: practical capacity
Objective: 5
AACSB: Reflective thinking

20) Practical capacity is unattainable in the real world.
Answer: FALSE
Explanation: Practical capacity is the level of capacity that reduces theoretical capacity by considering unavoidable operating interruptions, such as scheduled maintenance time, shutdowns for holidays, and so on. Theoretical capacity is unattainable in the real world.
Diff: 1
Terms: theoretical capacity
Objective: 5
AACSB: Analytical skills

21) Theoretical capacity is the capacity level that represents what the firm is able to obtain under reasonable circumstances.
Answer: FALSE
Explanation: Practical capacity is the capacity level that represents what the firm is able to obtain under reasonable circumstances.
Diff: 2
Terms: theoretical capacity
Objective: 5
AACSB: Reflective thinking
22) Match each of the following items with one or more of the denominator-level capacity concepts by putting the appropriate letter(s) by each item:

- a. Theoretical capacity
- b. Practical capacity
- c. Normal capacity utilization
- d. Master-budget capacity utilization

1. Reduces theoretical capacity by considering unavoidable operating interruptions
2. Producing at full efficiency all the time
3. Measures capacity levels in terms of demand
4. Level of capacity utilization that satisfies average customer demand over a period
5. Does not allow for plant maintenance
6. Engineering and human resource factors are important when estimating capacity
7. Level of capacity utilization that managers expect for the current budget period
8. Ideal goal of capacity utilization
9. Takes into account seasonal, cyclical, and trend factors
10. Measures capacity levels in terms of what a plant can supply

Answer:
1. b
2. a
3. c, d
4. c
5. a
6. a, b
7. d
8. a
9. c
10. a, b

Diff: 2

Terms: absorption costing, super-variable costing, throughput costing
Objective: 5
AACSB: Analytical skills
· For next month, the vice president of production plans on producing 4,400 wrenches per day.
· The company can produce as many as 5,000 wrenches per day, but is more likely to produce 4,500 per day.
· The demand for wrenches for the next three years is expected to average 4,250 wrenches per day.
· Fixed manufacturing costs per month total $336,600.
· The company works 20 days a month.
· Fixed manufacturing overhead is charged on a per-wrench basis.

**Required:**
a. What is the theoretical fixed manufacturing overhead rate per wrench?
b. What is the practical fixed manufacturing overhead rate per wrench?
c. What is the normal fixed manufacturing overhead rate per wrench?
d. What is the master-budget fixed manufacturing overhead rate per wrench?

**Answer:**
a. Theoretical overhead rate = $336,600 / (5,000 × 20) = $3.366
b. Practical overhead rate = $336,600 / (4,500 × 20) = $3.74
c. Normal overhead rate = $336,600 / (4,250 × 20) = $3.96
d. Master-budget overhead rate = $336,600 / (4,400 × 20) = $3.825

**Diff:** 2

**Terms:** absorption costing, super-variable costing, throughput costing

**Objective:** 5

**AACSB: Analytical skills**

**Objective 9.6**

1) Theoretical capacity:
A) represents real capacity available to the company
B) provides the best perspective of actual long-run costs
C) when used for product costing results in the lowest cost estimate of the four capacity options
D) replicates the cost of capacity in a competitor's cost structure

**Answer:** C

**Diff:** 3

**Terms:** theoretical capacity

**Objective:** 6

**AACSB: Reflective thinking**
2) The use of theoretical capacity results in an unrealistically low fixed manufacturing cost per unit because it is based on:
A) real available capacity
B) an unattainable level of capacity
C) normal capacity utilization
D) normal costing
Answer: B
Diff: 3
Terms: theoretical capacity
Objective: 6
AACSB: Reflective thinking

3) Budgeted fixed manufacturing costs of a product using practical capacity:
A) represents the cost per unit of supplying capacity
B) can result in setting selling prices that are not competitive
C) includes the cost of unused capacity
D) should be used to evaluate a marketing manager's performance in the current year
Answer: A
Diff: 3
Terms: practical capacity
Objective: 6
AACSB: Reflective thinking

4) Normal capacity utilization:
A) represents real capacity available to the company
B) can result in setting selling prices that are not competitive
C) when used for product costing results in the lowest cost estimate of the four capacity options
D) represents the maximum units of production intended for current capacity
Answer: B
Diff: 3
Terms: normal capacity utilization
Objective: 6
AACSB: Reflective thinking

5) Master-budget capacity utilization:
A) hides the amount of unused capacity
B) represents the maximum units of production intended for current capacity
C) provides the best cost estimate for benchmarking purposes
D) when used for product costing results in the lowest cost estimate of the four capacity options
Answer: A
Diff: 3
Terms: master-budget capacity utilization
Objective: 6
AACSB: Reflective thinking
6) From the perspective of long-run product costing it is best to use:
A) master-budget capacity utilization to highlight unused capacity
B) normal capacity utilization for benchmarking purposes
C) practical capacity for pricing decisions
D) theoretical capacity for performance evaluation
Answer: C
Diff: 3
Terms: practical capacity
Objective: 6
AACSB: Reflective thinking

7) Customers expect to pay a price that includes:
A) the cost of unused capacity
B) the cost of actual capacity used
C) no capacity costs
D) Both A and B are correct.
Answer: B
Diff: 2
Terms: practical capacity
Objective: 6
AACSB: Reflective thinking

8) The marketing manager's performance evaluation is most fair when based on a denominator level using:
A) practical capacity
B) theoretical capacity
C) master-budget capacity utilization
D) normal capacity utilization
Answer: C
Diff: 2
Terms: master-budget capacity utilization
Objective: 6
AACSB: Ethical reasoning

9) ________ is the continuing reduction in the demand for a company's products that occurs when competitor prices are NOT met.
A) Downward demand spiral
B) Theoretical capacity
C) Normal capacity
D) Practical capacity
Answer: A
Diff: 2
Terms: downward demand spiral
Objective: 6
AACSB: Reflective thinking
10) Using master-budget capacity to set selling prices:
A) avoids the recalculation of unit costs when expected demand levels change
B) spreads fixed costs over available capacity
C) can result in a downward demand spiral
D) uses the perspective of long-run product pricing
Answer: C
Diff: 2
Terms: master-budget capacity utilization
Objective: 6
AACSB: Reflective thinking

11) When large differences exist between practical capacity and master-budget capacity utilization, companies may:
A) classify the difference as planned unused capacity
B) use master-budget capacity utilization for setting selling prices
C) use practical capacity for meaningful feedback to the marketing manager
D) All of these answers are correct.
Answer: A
Diff: 2
Terms: practical capacity, master-budget capacity utilization
Objective: 6
AACSB: Reflective thinking

12) The effect of spreading fixed manufacturing costs over a shrinking master-budget capacity utilization amount results in:
A) greater utilization of capacity
B) increased unit costs
C) more competitive selling prices
D) greater demand for the product
Answer: B
Diff: 2
Terms: downward demand spiral
Objective: 6
AACSB: Reflective thinking

13) The higher the denominator level, the:
A) higher the budgeted fixed manufacturing cost rate
B) lower the amount of fixed manufacturing costs allocated to each unit produced
C) higher the favorable production-volume variance
D) more likely actual output will exceed the denominator level
Answer: B
Diff: 2
Terms: absorption costing
Objective: 6
AACSB: Reflective thinking
14) Operating income reported on the end-of-period financial statements is changed when ________ is (are) used to handle the production-volume variance at the end of the accounting period.
A) the adjusted allocation-rate approach
B) the proration approach
C) the write-off variances to cost of goods sold approach
D) All of these answers are correct.
Answer:  C
Diff: 3
Terms:  absorption costing
Objective:  6
AACSB:  Reflective thinking

15) Practical capacity may:
A) increase over time due to improvements in plant layout
B) decrease over time due to efficiencies offered by new technologies
C) cannot be altered unless there is a major plant expansion
D) Both A and B are correct.
Answer:  A
Diff: 2
Terms:  practical capacity
Objective:  6
AACSB:  Reflective thinking

16) The Internal Revenue Service requires the use of ________ for calculating fixed manufacturing costs per unit.
A) practical capacity
B) theoretical capacity
C) master-budget capacity utilization
D) normal capacity utilization
Answer:  A
Diff: 2
Terms:  practical capacity
Objective:  6
AACSB:  Ethical reasoning

17) Fixed manufacturing cost per unit will be the same no matter what capacity concept is used.
Answer:  FALSE
Explanation: Fixed manufacturing cost per unit will be different depending on the capacity concept used.
Diff: 2
Terms:  fixed cost, unit cost
Objective:  6
AACSB:  Reflective thinking
18) Data from normal costing and standard costing are used in pricing and product-mix decisions.
Answer: TRUE
Diff: 2
Terms: normal costing, standard costing
Objective: 6
AACSB: Communication

19) If a company chooses practical capacity for planning purposes, it must also use practical capacity for performance evaluation.
Answer: FALSE
Explanation: There is no requirement that one capacity-level concept has to be used for all purposes.
Diff: 2
Terms: practical capacity
Objective: 6
AACSB: Reflective thinking

20) Theoretical capacity is most often used to cost a product.
Answer: FALSE
Explanation: Theoretical capacity is unattainable and therefore should not be used to cost a product. Practical capacity is generally used to cost a product.
Diff: 2
Terms: theoretical capacity
Objective: 6
AACSB: Reflective thinking

21) The downward demand spiral for a company is the continuing reduction in the demand for its products that occurs when competitor prices are NOT met.
Answer: TRUE
Diff: 2
Terms: downward demand spiral
Objective: 6
AACSB: Reflective thinking

22) For benchmarking purposes it is best to use master-budget capacity because all competitors use about the same amount of capacity for production.
Answer: FALSE
Explanation: For benchmarking purposes it is best to use practical capacity because it best represents the long-run cost of capacity.
Diff: 2
Terms: master-budget capacity utilization
Objective: 6
AACSB: Reflective thinking

23) Using normal capacity for pricing decisions can lead to setting noncompetitive selling prices.
Answer: TRUE
Diff: 3
Terms: normal capacity utilization
Objective: 6
AACSB: Reflective thinking
24) Using master-budget capacity for pricing purposes can lead to a downward demand spiral.
Answer: TRUE
Diff: 2
Terms: master-budget capacity utilization, downward demand spiral
Objective: 6
AACSB: Reflective thinking

25) Using practical capacity is best for evaluating the marketing manager's performance for a particular year.
Answer: FALSE
Explanation: Using master-budget capacity is best for evaluating the marketing manager's performance.
Diff: 3
Terms: practical capacity
Objective: 6
AACSB: Reflective thinking

26) The production-volume variance is affected by the choice of capacity concept used to determine the denominator level.
Answer: TRUE
Diff: 2
Terms: practical capacity
Objective: 6
AACSB: Reflective thinking

27) The higher the denominator level the higher the budgeted fixed manufacturing cost rate per unit.
Answer: FALSE
Explanation: The higher the denominator level the lower the budgeted fixed manufacturing cost rate per unit.
Diff: 2
Terms: practical capacity
Objective: 6
AACSB: Reflective thinking

28) Master-budget capacity utilization can be more reliably estimated than normal capacity utilization.
Answer: TRUE
Diff: 2
Terms: master-budget capacity utilization
Objective: 6
AACSB: Reflective thinking

29) Unused capacity is not considered wasted resources because capacity has to be purchased in "large chunks" to accommodate future needs, NOT just the needs of the current period.
Answer: TRUE
Diff: 1
Terms: practical capacity
Objective: 6
AACSB: Reflective thinking
30) Ernsting Bottling Works manufactures glass bottles. January and February operations were identical in every way except for the planned production.

January had a production denominator of 35,000 units.
February had a production denominator of 36,000 units.
Fixed manufacturing costs totaled $126,000.

Sales for both months totaled 45,000 units with variable manufacturing costs of $4 per unit. Selling and administrative costs were $0.40 per unit variable and $60,000 fixed. The selling price was $10 per unit.

**Required:**
Compute the operating income for both months using absorption costing.

**Answer:**

*January manufacturing cost per unit:*
Variable costs: $4.00
Fixed costs ($126,000/35,000) 3.60
Total per unit $7.60

*February manufacturing cost per unit:*
Variable costs $4.00
Fixed costs $126,000/36,000 3.50
Total per unit $7.50

**January Income Statement**

Sales (45,000 $10) $450,000
Cost of goods sold (45,000 $7.60) 342,000
Gross margin $108,000
Other costs:
Variable selling and administrative $18,000
Fixed selling and administrative 60,000 78,000
Operating income $30,000

**February Income Statement**

Sales (45,000 $10) $450,000
Cost of goods sold (45,000 $7.50) 337,500
Gross margin $112,500
Other costs:
Variable selling and administrative $18,000
Fixed selling and administrative 60,000 78,000
Operating income $34,500

Diff: 2
Terms: absorption costing
Objective: 2, 6
AACSB: Analytical skills
31) a. List the four different measures of capacity.
b. Which measure of capacity is best for setting prices? Why?
c. Which measure of capacity is best for evaluating the performance of the marketing manager for the current year? Why?
   Answer:
a. Theoretical capacity, practical capacity, normal capacity utilization, and master-budget capacity utilization are the four measures of capacity.
b. Practical capacity is best to use when setting prices because only the actual cost of capacity used for production is included in the cost of a unit.
c. Master-budget capacity utilization is best for evaluating performance of managers over the current year because the manager should only be held accountable for budgeted sales of the current year and not production capacity, especially when there is unused capacity.
   Diff: 2
   Terms: theoretical/practical capacity, normal/master-budget capacity utilization
   Objective: 5, 6
   AACSB: Reflective thinking

Objective 9.7

1) It is most difficult to estimate ________ because of the need to predict demand for the next few years.
   A) practical capacity
   B) theoretical capacity
   C) master-budget capacity utilization
   D) normal capacity utilization
   Answer: D
   Diff: 2
   Terms: normal capacity utilization
   Objective: 7
   AACSB: Reflective thinking

2) Managers face uncertainty when estimating:
   A) demand of the product
   B) the denominator level for practical capacity
   C) total fixed manufacturing costs for the next accounting period
   D) All of these answers are correct.
   Answer: D
   Diff: 2
   Terms: practical capacity
   Objective: 7
   AACSB: Reflective thinking
3) Unused capacity:
A) is a definite sign of wasted resources
B) is intended for future use
C) provides capacity for potential demand surges
D) Both B and C are correct.
Answer: D
Diff: 2
Terms: practical capacity, normal capacity utilization
Objective: 7
AACSB: Reflective thinking

4) Capacity costs:
A) are difficult to estimate
B) don't provide a useful planning tool for nonmanufacturing firms
C) cannot be used with activity-based costing
D) All of these answers are correct.
Answer: A
Diff: 2
Terms: practical capacity, normal capacity utilization
Objective: 7
AACSB: Reflective thinking

5) The breakeven point using absorption costing depends on all of the following factors, EXCEPT:
A) the number of units sold during the current period
B) the budgeted level of production
C) the denominator level chosen for the fixed manufacturing overhead rate
D) fulfillment of current production quotas
Answer: B
Diff: 2
Terms: absorption costing
Objective: 7
AACSB: Reflective thinking

6) There is NOT an output-level variance for variable costing, because:
A) the inventory level decreased during the period
B) the inventory level increased during the period
C) fixed manufacturing overhead is allocated to work in process
D) fixed manufacturing overhead is not allocated to work in process
Answer: D
Diff: 2
Terms: variable costing
Objective: 7
AACSB: Reflective thinking
7) Challenges only result from estimating the denominator level, but NOT the costs in the numerator of
the fixed manufacturing cost rate.
Answer: FALSE
Explanation: Challenges result from estimating both the denominator level and the costs in the
numerator of the fixed manufacturing cost rate.
Diff: 1
Terms: practical capacity
Objective: 7
AACSB: Reflective thinking

8) Estimating capacity costs is unique to manufacturing and it is NOT applicable to nonmanufacturing
entities.
Answer: FALSE
Explanation: Estimating capacity costs is needed in both manufacturing and nonmanufacturing entities.
Diff: 1
Terms: practical capacity
Objective: 7
AACSB: Reflective thinking

9) If the capacity level chosen to calculate the budgeted fixed overhead cost rate is more than the actual
production, an unfavorable production-volume variance will result.
Answer: TRUE
Diff: 2
Terms: practical capacity
Objective: 7
AACSB: Reflective thinking

10) Explain how using master-budget capacity utilization for setting prices can lead to a downward
demand spiral.
Answer: If master-budget capacity utilization is used as the denominator level for determining fixed
manufacturing costs per unit, the cost includes a charge for unused capacity. If prices are based on this
cost, the product may be priced higher than competitor's products. With a higher selling price, volume of
sales will probably decrease reducing the expected number of future sales. Lower expected sales leads to
a lower denominator level, which in turn results in an even higher selling price and even lower sales
volume. Etc., etc., etc.
Diff: 2
Terms: downward demand spiral
Objective: 7
AACSB: Reflective thinking

11) Should a company with high fixed costs and unused capacity raise selling prices to try to fully
recoup its costs?
Answer: No, companies in this situation might experience greater reductions in the demand of their
products if they continue to raise selling prices. This would result in the fixed capacity costs being
spread over fewer and fewer units, increasing reported costs, resulting in more pressure to raise prices.
Diff: 3
Terms: normal capacity utilization
Objective: 7
AACSB: Analytical skills
12) How does the capacity level chosen to compute the budgeted fixed overhead cost rate affect the production-volume variance?
Answer: The chosen capacity level is directly related to the size and direction of the production-volume variance. When the chosen capacity level exceeds the actual production level, there will be an unfavorable production-volume variance; when the chosen capacity level is less than the actual production level, there will be a favorable production-volume variance.
Diff: 3
Terms: absorption costing
Objective: 7
AACSB: Reflective thinking

13) Discuss the three methods to dispose of production volume variance.
Answer: 1) Adjusted allocation-rate approach - This approach restates all amounts by using actual, rather than budgeted, cost rates.
2) Proration approach - The underallocated or overallocated overhead is spread among the ending balances in work-in-Process Control, finished Goods Control, and Cost of Goods Sold.
3) Write-off variances to cost of goods sold approach - The variance is written off to cost of goods sold.
Diff: 3
Terms: production-volume variance
Objective: 7
AACSB: Reflective thinking

Objective 9.A

Answer the following questions using the information below:

Ms. Janice Meyers, the company president, has heard that there are multiple breakeven points for every product. She does not believe this and has asked you to provide the evidence of such a possibility. Some information about the company for 2011 is as follows:

- Total fixed manufacturing overhead $180,000
- Total other fixed expenses $200,000
- Total variable manufacturing expenses $240,000
- Total other variable expenses $240,000
- Units produced 60,000 units
- Budgeted production 60,000 units
- Units sold 50,000 units
- Selling price $40

1) What are breakeven sales in units using variable costing?
A) 5,625 units
B) 5,769 units
C) 11,875 units
D) 12,180 units

Answer: C
Explanation: C) Breakeven units = ($180,000 + $200,000) / ($40 - $4 - $4) = 11,875 units
Diff: 2
Terms: variable costing
Objective: A
AACSB: Analytical skills
2) What are breakeven sales in units using absorption costing?
A) 5,625 units
B) 6,667 units
C) 6,897 units
D) 8,000 units
Answer: C
Explanation: C) Breakeven units $N = \frac{[$380,000 + ($180,000 / 60,000 × (N - 60,000))]}{($40-4-4)}$

$N = ($380,000 + 3N - $180,000)/32$
$32N = $200,000 + 3N$
$29N = $200,000$
$N = 6,897$ units

Diff: 2
Terms: absorption costing
Objective: A
AACSB: Analytical skills

3) What are breakeven sales in units using absorption costing if the production units are actually 25,000?
A) 5,625 units
B) 6,667 units
C) 7,667 units
D) 7,931 units
Answer: D
Explanation: D) Breakeven units $N = \frac{[$380,000 + ($180,000 / 60,000 × (N - 50,000))]}{($40-4-4)}$

$N = ($380,000 + 3N - $150,000)/32$
$32N = $230,000 + 3N$
$29N = $230,000$
$N = 7,931$ units

Diff: 2
Terms: absorption costing
Objective: A
AACSB: Analytical skills
Answer the following questions using the information below:

The following information pertains to the Bean Company:

- Selling price per unit $123
- Standard fixed manufacturing costs per unit $60
- Variable selling and administrative costs per unit $12
- Standard variable manufacturing costs per unit $3
- Fixed selling and administrative costs $48,000
- Units produced 10,000 units
- Units sold 9,600 units

4) What is the variable costing breakeven point in units?
   A) 833 units
   B) 5,556 units
   C) 5,838 units
   D) 6,000 units
   Answer: D
   Explanation: D) Breakeven units = \[\frac{\$48,000 + (10,000 \times \$60)}{123 - 3 - 12}\] = 6,000 units
   Diff: 2
   Terms: variable costing
   Objective: A
   AACSB: Analytical skills

5) What is the absorption costing breakeven point in units?
   A) 917 units
   B) 1,000 units
   C) 5,838 units
   D) 6,000 units
   Answer: B
   Explanation: B) Breakeven units \[N = \frac{\$648,000 + (60 \times (N - 10,000))}{123 - 3 - 12}\] = 1,000 units
   Diff: 2
   Terms: absorption costing
   Objective: A
   AACSB: Analytical skills
Answer the following questions using the information below:

Greene Manufacturing incurred the following expenses during 2011:

- Fixed manufacturing costs: $45,000
- Fixed nonmanufacturing costs: $35,000
- Unit selling price: $100
- Total unit cost: $40
- Variable manufacturing cost rate: $20
- Units produced: 1,340 units

6) What will be the breakeven point if variable costing is used?
A) 1,334 units  
B) 1,125 units  
C) 1,000 units  
D) 563 units  
Answer:  C  
Explanation: C) Breakeven units = ($45,000 + $35,000) / ($100 - $20) = 1,000 units  
Diff: 2  
Terms: variable costing  
Objective: A  
AACSB: Analytical skills

7) What will be the breakeven point in units if absorption costing is used?
A) 1,330 units  
B) 1,000 units  
C) 887 units  
D) 563 units  
Answer:  C  
Explanation: C) Breakeven units N = \( \frac{[($45,000 + $35,000) + ($20 \times (N - 1,340))]}{($100 -$20)} \)  
\[ N = \frac{($80,000 + $20N - $26,800)/$80}{80N = $53,200 + $20N} \]  
N = 887 units  
Diff: 2  
Terms: absorption costing  
Objective: A  
AACSB: Analytical skills
8) What is the breakeven point in units using absorption costing if the units produced are actually 2,250?
A) 1,330 units
B) 1,000 units
C) 887 units
D) 584 units
Answer: D
Explanation: D) Breakeven units \( N = \frac{($45,000 + $35,000 + ($20 \times (N - 2,250)))}{($100-$20)}\)

\( N = (80,000 + 20N - 45,000)/80 \)

\( 80N = 35,000 + 20N \)

\( N = 584 \) units

Diff: 2
Terms: absorption costing
Objective: A
AACSB: Analytical skills

9) The formula for computing the breakeven point in units under variable costing includes all of the following EXCEPT:
A) total fixed costs
B) contribution margin percentage
C) target operating income
D) contribution margin per unit
Answer: B
Diff: 2
Terms: breakeven point (BEP)
Objective: A
AACSB: Reflective thinking

10) Bosely Corporation is in the business of selling computers. The following expenses were incurred in March 2011:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed manufacturing costs</td>
<td>$75,000</td>
</tr>
<tr>
<td>Fixed nonmanufacturing costs</td>
<td>$35,000</td>
</tr>
<tr>
<td>Unit selling price</td>
<td>$1,200</td>
</tr>
<tr>
<td>Variable manufacturing cost</td>
<td>$700</td>
</tr>
<tr>
<td>Units produced</td>
<td>1,500</td>
</tr>
</tbody>
</table>

What will be the breakeven point if variable costing is used?
A) 150 units
B) 220 units
C) 157 units
D) 92 units
Answer: B
Explanation: B) ($75,000 + $35,000)/($1,200 – $700) = 220 units
Diff: 2
Terms: variable cost
Objective: A
AACSB: Analytical skills
11) The breakeven points are the same under both variable costing and absorption costing.
Answer: FALSE
Explanation: The breakeven points are generally different under both variable costing and absorption costing. If variable costing is used, the breakeven point (that’s where operating income is $0) is computed in the usual manner. If absorption costing is used, the required number of units to be sold to earn a specific target operating income is not unique because of the number of variables involved. The breakeven point under absorption costing depends on (1) fixed manufacturing costs, (2) fixed operating (marketing) costs, (3) contribution margin per unit, (4) unit level of production, and (5) the capacity level chosen as the denominator to set the fixed manufacturing cost rate.
Diff: 2
Terms: variable costing, absorption costing
Objective: A
AACSB: Reflective thinking

12) Sutton Hot Dog Stand sells hot dogs for $1.35. Variable costs are $1.05 per unit with fixed production costs of $90,000 per month at a level of 400,000 units. Fixed administrative costs total $30,000. Sales average 400,000 units per month, with planned production of 400,000 hot dogs.

Required:
  a. What are breakeven unit sales under variable costing?
  b. What are breakeven unit sales under absorption costing if she sells everything she prepares?
  c. What are breakeven unit sales under absorption costing if average sales are 498,000 and planned production is changed to 500,000?

Answer: a. Breakeven units = ($90,000 + $30,000) / ($1.35 - $1.05) = 400,000

  b. Breakeven units (N) = \[
  \frac{[$(90,000 + 30,000) + (0.225(N - 400,000))]}{1.35 - 1.05}
  \]

  N = ($120,000 + 0.225N - 90,000) / 0.30
  $0.30N = $30,000 + 0.225N
  $0.075N = $30,000
  N = 400,000 units

  c. Breakeven units (N) = \[
  \frac{[$(90,000 + 30,000) + (0.18(N - 500,000))]}{1.35 - 1.05}
  \]

  N = ($120,000 + 0.18N - 90,000) / 0.30
  $0.3N = $30,000 + 0.18N
  $0.12N = $30,000
  N = 250,000 units

Diff: 2
Terms: absorption costing, super-variable costing, throughput costing
Objective: A
AACSB: Analytical skills
Objective 10.1

1) Which of the following statements related to assumptions about estimating linear cost functions is FALSE?
A) Variations in a single cost driver explain variations in total costs.
B) A cost object is anything for which a separate measurement of costs is desired.
C) A linear function approximates cost behavior within the relevant range of the cost driver.
D) A high correlation between two variables ensures that a cause-and-effect relationship exists.
Answer: D
Diff: 2
Terms: cost estimation, linear cost function
Objective: 1
AACSB: Reflective thinking

2) A high correlation between two variables \( s \) and \( t \) indicates that:
A) \( s \) may cause \( t \), or \( t \) may cause \( s \)
B) both may be affected by a third variable
C) the correlation may be due to random chance
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: cost function
Objective: 1
AACSB: Reflective thinking

3) Which of the following does NOT represent a cause-and-effect relationship?
A) Material costs increase as the number of units produced increases.
B) A company is charged 40 cents for each brochure printed and mailed.
C) Utility costs increase at the same time that insurance costs increase.
D) It makes sense that if a complex product has a large number of parts it will take longer to assemble than a simple product with fewer parts.
Answer: C
Diff: 3
Terms: cost function
Objective: 1
AACSB: Reflective thinking
4) Bennet Company employs 30 individuals. Eighteen employees are paid $14 per hour and the rest are salaried employees paid $4,000 a month. How would total costs of personnel be classified?
A) variable
B) mixed
C) a variable cost within a relevant range
D) a fixed cost within a relevant range
Answer: B
Diff: 2
Terms: mixed cost
Objective: 1
AACSB: Analytical skills

5) McGuinness Company employs 8 individuals. They are all paid $14.50 per hour. How would total costs of personnel be classified?
A) variable
B) mixed
C) a variable cost within a relevant range
D) a fixed cost within a relevant range
Answer: A
Diff: 2
Terms: variable cost
Objective: 1
AACSB: Analytical skills

6) For February, the cost components of a picture frame include $0.25 for the glass, $.65 for the wooden frame, and $0.80 for assembly. The assembly desk and tools cost $400. 1,000 frames are expected to be produced in the coming year. What cost function best represents these costs?
A) \( y = 1.70 + 400X \)
B) \( y = 400 +1.70X \)
C) \( y = 2.10 + 1,000X \)
D) \( y = .90 + 400X \)
Answer: B
Diff: 2
Terms: linear cost function
Objective: 1
AACSB: Analytical skills

7) The cost components of a heater include $35 for the compressor, $12 for the sheet molded compound frame, and $80 per unit for assembly. The factory machines and tools cost is $55,000. The company expects to produce 1,500 heaters in the coming year. What cost function best represents these costs?
A) \( y = 1,500 + 127X \)
B) \( y = 1,500 +55,000X \)
C) \( y = 55,000 + 1,500X \)
D) \( y = 55,000 +127X \)
Answer: D
Diff: 2
Terms: linear cost function
Objective: 1
AACSB: Analytical skills

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8) A linear cost function can represent:
A) mixed cost behaviors
B) fixed cost behaviors
C) variable cost behaviors
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: linear cost function
Objective: 1
AACSB: Reflective thinking

9) The cost function \( y = 2,000 + 6X \):
A) has a slope coefficient of 2,000
B) has an intercept of 6
C) is a straight line
D) represents a fixed cost
Answer: C
Diff: 2
Terms: linear cost function
Objective: 1
AACSB: Analytical skills

10) The cost function \( y = 150 + 10X \):
A) has a slope coefficient of 150
B) has an intercept of 150
C) is a nonlinear
D) represents a fixed cost
Answer: B
Diff: 2
Terms: linear cost function
Objective: 1
AACSB: Analytical skills

11) The cost function \( y = 10,000 + 3X \):
A) represents a mixed cost
B) will intersect the y-axis at 3
C) has a slope coefficient of 10,000
D) is a curved line
Answer: A
Diff: 2
Terms: linear cost function
Objective: 1
AACSB: Analytical skills
12) The cost function \( y = 90 + 8X \):
A) has a slope coefficient of -8
B) will intersect the y-axis at 8
C) has a slope coefficient of 8
D) is a curved line
Answer: C
Diff: 2
Terms: linear cost function
Objective: 1
AACSB: Analytical skills

13) Which of the following is an equation of a fixed cost function?
A) \( y = bX + a \)
B) \( y = a + bX \)
C) \( y = bX \)
D) \( y = a \)
Answer: D
Diff: 2
Terms: linear cost function
Objective: 1
AACSB: Analytical skills

14) One assumption frequently made in cost behavior estimation is that changes in total costs can be explained by changes in the level of a single activity.
Answer: TRUE
Diff: 1
Terms: cost estimation
Objective: 1
AACSB: Analytical skills

15) A cost function is a mathematical description of how a cost changes with changes in the level of an activity relating to that cost.
Answer: TRUE
Diff: 1
Terms: cost function
Objective: 1
AACSB: Reflective thinking

16) All cost functions are linear.
Answer: FALSE
Explanation: All cost functions are not linear, but for cost-behavior estimation we assume some are linear within a relevant range.
Diff: 1
Terms: cost function
Objective: 1
AACSB: Reflective thinking
17) When plotted on a graph, cost functions are usually displayed by having the level of activity (machine hours, etc.) plotted on the horizontal axis (called the x-axis) and the amount of total costs corresponding to (or dependent on) the levels of that activity on the vertical axis (called the y-axis).
Answer: TRUE
Diff: 1
Terms: cost function
Objective: 1
AACSB: Reflective thinking

18) When estimating a cost function, cost behavior can be approximated by a linear cost function within the relevant range.
Answer: TRUE
Diff: 2
Terms: cost estimation, cost function
Objective: 1
AACSB: Reflective thinking

19) y = a + bX represents the general form of the linear cost function, which is expressed in Excel as y=mx+b.
Answer: TRUE
Diff: 1
Terms: cost function, linear cost function
Objective: 1
AACSB: Reflective thinking

20) The longer the time horizon, the more likely a cost will be variable.
Answer: TRUE
Diff: 2
Terms: cost function, linear cost function
Objective: 1
AACSB: Reflective thinking

21) Outside of the relevant range, variable and fixed cost-behavior patterns remain constant.
Answer: FALSE
Explanation: Outside of the relevant range, variable and fixed cost-behavior patterns may change.
Diff: 2
Terms: cost function, linear cost function
Objective: 1
AACSB: Reflective thinking

22) Any linear cost function can be graphed by knowing only the slope coefficient.
Answer: FALSE
Explanation: A linear function can be graphed if the slope coefficient and the intercept are known.
Diff: 1
Terms: cost function, linear cost function
Objective: 1
AACSB: Reflective thinking
23) Knowing the proper relevant range is essential to properly classify costs. 
Answer: TRUE 
Diff: 1 
Terms: cost function 
Objective: 1 
AACSB: Reflective thinking 

24) Write a linear cost function equation for each of the following conditions. Use y for estimated costs and X for activity of the cost driver. 

a. Direct manufacturing labor is $20 per hour. 
b. Direct materials cost $18.40 per cubic yard. 
c. Utilities have a minimum charge of $2,000, plus a charge of $0.10 per kilowatt-hour. 
d. Machine operating costs include $400,000 of machine depreciation per year, plus $150 of utility costs for each day the machinery is in operation. 
Answer: 
a. $y = 20X$ 
b. $y = 18.40X$ 
c. $y = 2,000 + 0.10X$ 
d. $y = 400,000 + 150X$ 
Diff: 1 
Terms: linear cost function 
Objective: 1 
AACSB: Analytical skills 

25) Write a linear cost function equation for each of the following conditions. Use y for estimated costs and x for activity of the cost driver. 

a. Direct materials cost is $1.50 per pound. 
b. Direct labor cost is $33.50 per hour. 
c. Auto rental has a fixed fee of $150.00 per day plus $1.00 per mile driven. 
d. Machine operating costs include $700 of maintenance per month, and $10.00 of coolant usage costs for each day the machinery is in operation. 
Answer: 
a. $y = 1.50X$ 
b. $y = 33.50X$ 
c. $y = 150 + 1.00X$ 
d. $y = 700 + 10X$ 
Diff: 1 
Terms: linear cost function 
Objective: 1 
AACSB: Analytical skills
Objective 10.2

1) The cause and-effect relationship might arise as a result of which of the following:
   A) a physical relationship between the level of activity and costs.
   B) a contractual arrangement.
   C) knowledge of operations.
   D) All of the above.
   Answer: D
   Diff: 2
   Terms: cost estimation, industrial engineering method
   Objective: 2
   AACSB: Reflective thinking

2) A linear cost function can only represent fixed cost behavior.
   Answer: FALSE
   Explanation: A linear cost function can represent fixed, mixed, or variable cost behavior.
   Diff: 1
   Terms: cost function, linear cost function
   Objective: 2
   AACSB: Reflective thinking

3) In a graphical display of a cost function, the steepness of the slope represents the total amount of fixed costs.
   Answer: FALSE
   Explanation: In a graphical display of a cost function, the constant or the y-intercept represents the amount of fixed costs.
   Diff: 1
   Terms: cost function, linear cost function
   Objective: 2
   AACSB: Reflective thinking

4) It can be inferred that when there is a high correlation between two variables, one is the cause of the other.
   Answer: FALSE
   Explanation: It cannot be inferred that a high correlation between two variables indicates that one is the cause of the other. A high correlation simply indicates that the variables move together.
   Diff: 2
   Terms: cost function
   Objective: 2
   AACSB: Analytical skills

5) An example of a physical cause-and-effect relationship is when additional units of production increase total direct material costs.
   Answer: TRUE
   Diff: 2
   Terms: cost function
   Objective: 2
   AACSB: Analytical skills
6) Managers should use past data to create a cost function and then use the exact information provided by that cost function to create the budgetary forecast for the next year.
Answer: FALSE
Explanation: Managers are interested in estimating past cost-behavior functions because the estimates can help them make more accurate cost predictions, or forecasts, about future costs. But better management decisions, cost predictions, and estimation of cost functions can be achieved only if managers correctly identify the factors that affect costs.
Diff: 2
Terms: cost function
Objective: 2
AACSB: Reflective thinking

7) What are the two assumptions behind a simple linear cost function? Briefly explain the three ways that a linear cost function may behave?
Answer: The two usual assumptions behind a simple linear cost function are:
1) Variations in the level of a single activity (the cost driver) explain the variations in the related total costs; and
2) Cost behavior is approximated by a linear cost function within the relevant range. This means that total cost versus the level of a single activity that is related to that cost is a straight line within the relevant range.

Once linearity is established, there are three possible types of linearity:
1) A strictly variable cost of the form \( Y = bX \), where \( b \) is the slope of the straight line and is the variable cost per unit of the cost driver;
2) A strictly constant cost of the form \( Y = a \), where \( a \) is the total fixed cost or constant; and
3) A mixed or semivariable cost of the form \( Y = a + bX \), where \( a \) is the total fixed cost or constant, and \( b \) is the variable cost per unit of the driver or the slope of the straight line.
Diff: 2
Terms: cost function, linear cost function
Objective: 1, 2
AACSB: Reflective thinking

Objective 10.3

1) The conference method estimates cost functions:
A) using quantitative methods that can be very time consuming and costly
B) based on analysis and opinions gathered from various departments
C) using time-and-motion studies
D) by mathematically analyzing the relationship between inputs and outputs in physical terms
Answer: B
Diff: 2
Terms: conference method, cost estimation
Objective: 3
AACSB: Communication
2) The account analysis method estimates cost functions:
A) by classifying cost accounts as variable, fixed, or mixed based on qualitative analysis
B) using time-and-motion studies
C) at a high cost, which renders it seldom used
D) in a manner that cannot be usefully combined with any other cost estimation methods
Answer: A
Diff: 2
Terms: account analysis method
Objective: 3
AACSB: Reflective thinking

3) Quantitative analysis methods estimate cost functions:
A) which depend on the experience and judgment of the analyst for accuracy
B) based on analysis and opinions gathered from various departments
C) using significant amounts of historical data
D) using the pooling of knowledge from each value chain function
Answer: C
Diff: 2
Terms: cost estimation, cost function
Objective: 3
AACSB: Reflective thinking

4) Gathering cost information through observations and interviews from departments within an organization is known as the:
A) account analysis method
B) conference method
C) industrial engineering method
D) quantitative analysis method
Answer: B
Diff: 1
Terms: account analysis method
Objective: 3
AACSB: Communication

5) Which cost estimation method analyzes accounts in the subsidiary ledger as variable, fixed, or mixed using qualitative methods?
A) the account analysis method
B) the conference method
C) the industrial engineering method
D) the quantitative analysis method
Answer: A
Diff: 1
Terms: account analysis method
Objective: 3
AACSB: Reflective thinking
6) Which cost estimation method uses a formal mathematical method to develop cost functions based on past data?
A) the account analysis method
B) the conference method
C) the industrial engineering method
D) the quantitative analysis method
Answer: D
Diff: 1
Terms: cost function
Objective: 3
AACSB: Reflective thinking

7) Which cost estimation method may use time-and-motion studies to analyze the relationship between inputs and outputs in physical terms?
A) the account analysis method
B) the conference method
C) the industrial engineering method
D) the quantitative analysis method
Answer: C
Diff: 1
Terms: cost estimation, industrial engineering method
Objective: 3
AACSB: Reflective thinking

Answer the following questions using the information below:

At the Todd Company, the cost of the personnel department has always been charged to production departments based upon number of employees. Recently, opinions gathered from the department managers indicate that the number of new hires might be a better predictor of personnel costs.

Total personnel department costs are $320,000.

<table>
<thead>
<tr>
<th>Department</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of employees</td>
<td>30</td>
<td>270</td>
<td>100</td>
</tr>
<tr>
<td>The number of new hires</td>
<td>8</td>
<td>12</td>
<td>5</td>
</tr>
</tbody>
</table>

8) If the number of employees is considered the cost driver, what amount of personnel costs will be allocated to Department A?
A) $24,000
B) $10,667
C) $102,400
D) $40,000
Answer: A
Explanation: A) \( \frac{30}{30 + 270 + 100} \times 320,000 = 24,000 \)
Diff: 2
Terms: cost estimation
Objective: 3
AACSB: Communication
9) If the number of new hires is considered the cost driver, what amount of personnel costs will be allocated to Department A?
A) $24,000
B) $10,667
C) $102,400
D) $40,000
Answer: C
Explanation: C) \[\frac{8}{8 + 12 + 5} \times 320,000 = 102,400\]
Diff: 2
Terms: cost estimation
Objective: 3
AACSB: Analytical skills

10) Which cost estimation method is being used by Todd Company?
A) the industrial engineering method
B) the conference method
C) the account analysis method
D) the quantitative analysis method
Answer: B
Diff: 2
Terms: cost estimation
Objective: 3
AACSB: Analytical skills

Answer the following questions using the information below:

At the Christopher Company, the cost of the library and information center has always been charged to the various departments based upon number of employees. Recently, opinions gathered from the department managers indicate that the number of engineers within a department might be a better predictor of library and information center costs.

Total library and information center costs are $150,000.

<table>
<thead>
<tr>
<th>Department</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of employees</td>
<td>125</td>
<td>500</td>
<td>125</td>
</tr>
<tr>
<td>The number of engineers</td>
<td>0</td>
<td>75</td>
<td>25</td>
</tr>
</tbody>
</table>

11) Which cost estimation method is being used by Christopher Company?
A) the quantitative analysis method
B) the industrial engineering method
C) the conference method
D) the account analysis method
Answer: C
Diff: 2
Terms: cost estimation
Objective: 3
AACSB: Communication
12) If the number of employees is considered the cost driver, what amount of library and information center costs will be allocated to Department A?
A) $100,000
B) $25,000
C) $0
D) $112,500
Answer: B
Explanation: B) \( \frac{125}{125 + 500 + 125} \times 150,000 = 25,000 \)
Diff: 2
Terms: cost estimation
Objective: 3
AACSB: Analytical skills

13) If the number of engineers is considered the cost driver, what amount of library and information center costs will be allocated to Department A?
A) $100,000
B) $25,000
C) $0
D) $112,500
Answer: C
Explanation: C) \( \frac{0}{0 + 75 + 25} \times 150,000 = 0 \)
Diff: 2
Terms: cost estimation
Objective: 3
AACSB: Analytical skills

Answer the following questions using the information below:

Jerry's TV and Appliance Store is a small company that has hired you to perform some management advisory services. The following information pertains to 2011 operations.

Sales (1,000 televisions) $ 900,000
Cost of goods sold 400,000
Store manager's salary per year 70,000
Operating costs per year 157,000
Advertising and promotion per year 15,000
Commissions (4% of sales) 36,000

14) What was the variable cost per unit sold for 2011?
A) $36
B) $436
C) $678
D) $400
Answer: B
Explanation: B) \( \frac{(400,000 + 36,000)}{1,000} = 436 \) per unit
Diff: 2
Terms: cost estimation, slope coefficient
Objective: 3
AACSB: Analytical skills
15) What were total fixed costs for 2011?
A) $678,000  
B) $436,000  
C) $242,000  
D) $227,000
Answer:  C
Explanation:  C) $70,000 + $157,000 + $15,000 = $242,000
Diff: 2
Terms:  cost estimation, cost function
Objective:  3
AACSB:  Analytical skills

16) What are the estimated total costs if Penny's expects to sell 3,000 units next year?
A) $1,550,000  
B) $1,332,000  
C) $1,671,000  
D) $1,453,000
Answer:  A
Explanation:  A) $1,550,000 = $70,000 + $157,000 + $15,000 + [(\$400,000 + \$36,000) / 1,000 ] \times 3,000
Diff: 3
Terms:  cost predictions
Objective:  3
AACSB:  Analytical skills

17) Which cost estimation method is being used by Jerry's TV and Appliance Store?
A) the industrial engineering method  
B) the conference method  
C) the account analysis method  
D) the quantitative analysis method
Answer:  C
Diff: 2
Terms:  cost estimation, account analysis method
Objective:  3
AACSB:  Analytical skills
Answer the following questions using the information below:

Miller's Good Value Appliance Store is a small company that has hired you to perform some management advisory services. The following information pertains to 2011 operations.

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (5,000 microwave ovens)</td>
<td>$1,350,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>$540,000</td>
</tr>
<tr>
<td>Store manager's salary per year</td>
<td>$75,000</td>
</tr>
<tr>
<td>Operating costs per year</td>
<td>$225,000</td>
</tr>
<tr>
<td>Advertising and promotion per year</td>
<td>$25,000</td>
</tr>
<tr>
<td>Commissions (4% of sales)</td>
<td>$67,500</td>
</tr>
</tbody>
</table>

18) Which cost estimation method is being used by Miller's Good Value Appliance Store?
A) the account analysis method
B) the conference method
C) the quantitative analysis method
D) the industrial engineering method
Answer: A
Diff: 2
Terms: cost estimation, account analysis method
Objective: 3
AACSB: Analytical skills

19) What was the variable cost per unit sold for 2011?
A) $13.50
B) $108
C) $121.50
D) $186.50
Answer: C
Explanation: C) ($540,000 + $67,500) / 5,000 = $121.50 per unit
Diff: 2
Terms: cost estimation, slope coefficient
Objective: 3
AACSB: Analytical skills

20) What were total fixed costs for 2008?
A) $932,500
B) $325,000
C) $250,000
D) $225,000
Answer: B
Diff: 2
Terms: cost estimation, cost function
Objective: 3
AACSB: Analytical skills
21) What are the estimated total costs if Miller's expects to sell 6,500 units next year?
A) $932,500  
B) $1,114,750  
C) $1,017,500  
D) $665,000  
Answer: B  
Explanation: B) $1,114,750 = $75,000 + $225,000 + 15,000 + [(540,000 + 67,500) / 5,000] × 6,500  
Diff: 3  
Terms: cost predictions  
Objective: 3  
AACSB: Analytical skills

22) The industrial engineering method of cost estimation is based on opinions from various departments and is quick and of low cost to apply.  
Answer: FALSE  
Explanation: The conference method of cost estimation is based on opinions from various departments and is quick and of low cost to apply.  
Diff: 1  
Terms: cost estimation, industrial engineering method  
Objective: 3  
AACSB: Communication

23) The account analysis method of cost estimation classifies account costs as fixed, mixed, or variable using qualitative judgments.  
Answer: TRUE  
Diff: 1  
Terms: cost estimation, account analysis method  
Objective: 3  
AACSB: Reflective thinking

24) The account analysis method estimates cost functions by classifying various cost accounts as variable, fixed, or mixed with respect to the identified level of activity.  
Answer: TRUE  
Diff: 1  
Terms: account analysis method  
Objective: 3  
AACSB: Reflective thinking

25) The quantitative analysis method uses a formal mathematical method to identify cause-and-effect relationships among past data observations.  
Answer: TRUE  
Diff: 1  
Terms: quantitative analysis method  
Objective: 3  
AACSB: Reflective thinking
26) The cost of the personnel department at the Miller Company has always been charged to the production departments based upon number of employees. Recently, opinions gathered from the department managers indicated that the number of new hires might also be a predictor of personnel costs to be assigned. Total personnel department costs are $120,000.

<table>
<thead>
<tr>
<th>Cost Driver</th>
<th>Department A</th>
<th>Department B</th>
<th>Department C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of employees</td>
<td>300</td>
<td>250</td>
<td>50</td>
</tr>
<tr>
<td>The number of new hires</td>
<td>15</td>
<td>25</td>
<td>10</td>
</tr>
</tbody>
</table>

**Required:**
Using the above data, prepare a report that contrasts the different amounts of personnel department cost that would be allocated to each of the production departments if the cost driver used is

a. number of employees.
b. the number of new hires.
c. Which cost estimation method is being used by Miller Company?

**Answer:**

<table>
<thead>
<tr>
<th>Cost Driver</th>
<th>Department A</th>
<th>Department B</th>
<th>Department C</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Number of employees</td>
<td>300/600</td>
<td>250/600</td>
<td>50/600</td>
</tr>
<tr>
<td></td>
<td>$60,000</td>
<td>$50,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>b. The number of new hires</td>
<td>15/50</td>
<td>25/50</td>
<td>10/50</td>
</tr>
<tr>
<td></td>
<td>$36,000</td>
<td>$60,000</td>
<td>$24,000</td>
</tr>
</tbody>
</table>

c. Miller Company is using the *conference method* for cost estimation.

Diff: 2
Terms: conference method, cost estimation
Objective: 3
AACSB: Communication
27) Munir Hassan, controller, gathered data on overhead costs and direct labor-hours over the past 12 months. List and discuss the different approaches Munir can use to estimate a cost function for overhead costs using direct labor-hours as the cost driver.

Answer: The four approaches to cost estimation are:

1. industrial engineering method
2. conference method
3. account analysis method
4. quantitative analysis of current or past cost relationships

The industrial engineering method, also called the work-measurement method, estimates cost functions by analyzing the relationship between inputs and outputs in physical terms.

The conference method estimates cost functions on the basis of analysis and opinions about costs and their drivers gathered from various departments of an organization (purchasing, process engineering, manufacturing, employee relations, etc.).

The account analysis method estimates cost functions by classifying cost accounts in the ledger as variable, fixed, or mixed with respect to the identified cost driver.

Quantitative analysis of cost relationships are formal methods, such as the high-low method or regression, to fit linear cost functions to past data observations.

Diff: 2
Terms: cost estimation, industrial engineering/conference/account analysis method
Objective: 3
AACSB: Reflective thinking

Objective 10.4

1) The cost to be predicted is referred to as the:
A) independent variable
B) dependent variable
C) cost driver
D) regression
Answer: B
Diff: 2
Terms: dependent variable, cost function
Objective: 4
AACSB: Reflective thinking

2) The independent variable:
A) is also referred to as the cost driver
B) may also be called the cost-allocation base if referring to an indirect cost
C) should have an economically plausible relationship with the dependent variable
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: independent variable, cost function
Objective: 4
AACSB: Reflective thinking
3) How many separate cost pools should be formed given the following information:

<table>
<thead>
<tr>
<th>Cost</th>
<th>Cost driver</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postage costs</td>
<td># of brochures mailed</td>
</tr>
<tr>
<td>Printing and paper costs</td>
<td># of brochures mailed</td>
</tr>
<tr>
<td>Quality control costs</td>
<td># of inspections</td>
</tr>
<tr>
<td>Customer service costs</td>
<td># of customers served</td>
</tr>
</tbody>
</table>

A) 1 cost pool
B) 2 cost pools
C) 3 cost pools
D) 4 cost pools
Answer: C
Diff: 2
Terms: cost function, cost estimation
Objective: 4
AACSB: Analytical skills

4) Place the following steps in order for estimating a cost function using quantitative analysis:

A = Plot the data
B = Estimate the cost function
C = Choose the dependent variable
D = Identify the cost driver

A) D C A B
B) C D A B
C) A D C B
D) D C B A
Answer: B
Diff: 2
Terms: cost function
Objective: 4
AACSB: Analytical skills

5) All individual cost items included in the dependent variable should have:
A) the same cost driver
B) a cause-and-effect relationship with the independent variable
C) an economically plausible relationship with the independent variable
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: dependent variable
Objective: 4
AACSB: Reflective thinking
6) Collecting data on the dependent variable and the cost driver may include:
A) interviews with managers
B) collecting data over a long period of time
C) collecting data from different entities over the same period of time
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: cost function, dependent variable
Objective: 4
AACSB: Reflective thinking

7) A plot of data that results in bunched points with little slope generally indicates:
A) a strong relationship
B) a weak relationship
C) a positive relationship
D) a negative relationship
Answer: B
Diff: 3
Terms: cost estimation, cost function
Objective: 4
AACSB: Reflective thinking

8) A plot of data that results in one extreme observation most likely indicates that:
A) more than one cost pool should be used
B) an unusual event such as a plant shutdown occurred during that month
C) the cost-allocation base has been incorrectly identified
D) individual cost items do not have the same cost driver
Answer: B
Diff: 2
Terms: cost estimation, cost function
Objective: 4
AACSB: Reflective thinking

9) Cross-sectional data analysis includes:
A) using a variety of time periods to measure the dependent variable
B) using the highest and lowest observation
C) observing different entities during the same time period
D) comparing information in different cost pools
Answer: C
Diff: 2
Terms: cost estimation
Objective: 4
AACSB: Reflective thinking
10) Time-series data analysis includes:
A) using a variety of time periods to measure the dependent variable
B) using the highest and lowest observation
C) observing different entities during the same time period
D) comparing information in different cost pools
Answer: A
Diff: 2
Terms: cost estimation
Objective: 4
AACSB: Reflective thinking

11) When using the high-low method, the two observations used are the high and low observations of the:
A) cost driver
B) dependent variables
C) slope coefficient
D) residual term
Answer: A
Diff: 2
Terms: high-low method
Objective: 4
AACSB: Reflective thinking

12) When using the high-low method, the denominator of the equation that determines the slope is the:
A) dependent variable
B) independent variable
C) difference between the high and low observations of the cost driver
D) difference between the high and low observations of the dependent variables
Answer: C
Diff: 2
Terms: high-low method
Objective: 4
AACSB: Reflective thinking

13) The high-low method:
A) easily handles estimating the relationship between the dependent variable and two or more independent variables
B) is more accurate than the regression method
C) calculates the slope coefficient using only two observed values within the relevant range
D) uses the residual term to measure goodness of fit
Answer: C
Diff: 3
Terms: high-low method
Objective: 4
AACSB: Reflective thinking
14) Put the following steps in order for using the high-low method of estimating a cost function:
A = Identify the cost function
B = Calculate the constant
C = Calculate the slope coefficient
D = Identify the highest and lowest observed values

A) D C A B
B) C D A B
C) A D C B
D) D C B A
Answer: D
Diff: 2
Terms: cost estimation, cost function
Objective: 4
AACSB: Analytical skills

15) Regression analysis:
A) is simple to compute
B) measures the change in a dependent variable associated with one or more independent variables
C) is mathematical so it does not require an understanding of operations
D) uses the constant to measure goodness of fit
Answer: D
Diff: 3
Terms: regression analysis
Objective: 4
AACSB: Reflective thinking

16) Simple regression differs from multiple regression in that:
A) multiple regression uses all available data to estimate the cost function, whereas simple regression
only uses simple data
B) simple regression is limited to the use of only the dependent variables and multiple regression can
use both dependent and independent variables
C) simple regression uses only one independent variable and multiple regression uses more than one
independent variable
D) simple regression uses only one dependent variable and multiple regression uses more than one
dependent variable
Answer: C
Diff: 2
Terms: simple regression
Objective: 4
AACSB: Reflective thinking
17) The slope of the line of regression is the:  
A) rate at which the dependent variable varies  
B) rate at which the independent variable varies  
C) level of total fixed costs  
D) level of total variable costs  
Answer: A  
Diff: 2  
Terms: regression analysis, slope coefficient  
Objective: 4  
AACSB: Reflective thinking  

Answer the following questions using the information below:  

The Delmonico Company uses the high-low method to estimate the cost function. The information for 2011 is provided below:  

<table>
<thead>
<tr>
<th>Machine-hours</th>
<th>Labor Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest observation of cost driver</td>
<td>400</td>
</tr>
<tr>
<td>Lowest observation of cost driver</td>
<td>240</td>
</tr>
</tbody>
</table>

18) What is the slope coefficient per machine-hour?  
A) $56.66  
B) $0.10  
C) $40.00  
D) $50.00  
Answer: C  
Explanation:  
C) Slope = ($20,000 - $13,600) / (400 - 240) = $40  
Diff: 2  
Terms: high-low method, slope coefficient  
Objective: 4  
AACSB: Analytical skills  

19) What is the constant for the estimating cost equation?  
A) $4,000  
B) $13,600  
C) $16,000  
D) $20,000  
Answer: A  
Explanation:  
A) EITHER: Constant = $20,000 - ($40.00 × 400 hours) = $4,000  
OR: Constant = $13,600 - ($40.00 × 240 hours) = $4,000  
Diff: 2  
Terms: high-low method, cost estimation  
Objective: 4  
AACSB: Analytical skills
20) What is the estimate of the total cost when 300 machine-hours are used?
A) $4,000
B) $8,000
C) $12,000
D) $16,000
Answer: D
Explanation: D) \( y = $4,000 + (\$40 \times 300) = $16,000 \)
Diff: 3
Terms: cost predictions, high-low method
Objective: 4
AACSB: Analytical skills

Answer the following questions using the information below:

The Ranger Company uses the high-low method to estimate it's cost function. The information for 2011 is provided below:

<table>
<thead>
<tr>
<th>Machine-hours</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest observation of cost driver</td>
<td>2,000</td>
</tr>
<tr>
<td>Lowest observation of cost driver</td>
<td>1,000</td>
</tr>
</tbody>
</table>

21) What is the slope coefficient per machine-hour?
A) $250.00
B) $25
C) $20.00
D) $200.00
Answer: D
Explanation: D) \( \text{Slope} = \frac{($450,000 - $250,000)}{(2,000 - 1,000)} = $200 \)
Diff: 2
Terms: high-low method, slope coefficient
Objective: 4
AACSB: Analytical skills

22) What is the constant for the estimating cost equation?
A) $250,000
B) $450,000
C) $50,000
D) $0
Answer: C
Explanation:
C) EITHER: Constant = $450,000 - ($200.00 \times 2,000 \text{ hours}) = $50,000
OR: Constant = $250,000 - ($200.00 \times 1,000 \text{ hours}) = $50,000
Diff: 2
Terms: high-low method, cost estimation
Objective: 4
AACSB: Analytical skills
23) What is the estimate of the total cost when 1,100 machine-hours are used?
A) $250,000
B) $270,000
C) $300,000
D) $400,000
Answer: B
Explanation: B) \( y = $50,000 + ($200 \times 1,100) = $270,000 \)
Diff: 3
Terms: cost predictions, high-low method
Objective: 4
AACSB: Analytical skills

Answer the following questions using the information below:

For Alice Company, labor-hours are 25,000 and wages $94,000 at the high point of the relevant range, and labor-hours are 15,000 and wages $70,000 at the low point of the relevant range.

24) What is the slope coefficient per labor-hour?
A) $4.67
B) $3.76
C) $2.40
D) $0.42
Answer: C
Explanation: C) Slope = \( \frac{($94,000 - $70,000)}{(25,000 - 15,000)} \) = $2.40 per labor-hour
Diff: 2
Terms: high-low method, slope coefficient
Objective: 4
AACSB: Analytical skills

25) What is the constant?
A) $34,000
B) $24,000
C) $10,000
D) $83,500
Answer: A
Explanation: A) Constant = \( $94,000 - ($2.40 \times 25,000) = $34,000 \)
OR: Constant = \( $70,000 - ($2.40 \times 15,000) = $34,000 \)
Diff: 2
Terms: high-low method
Objective: 4
AACSB: Analytical skills
26) What is the estimate of total labor costs at Alice Company when 10,000 labor-hours are used?
A) $17,000  
B) $41,000  
C) $21,167  
D) $27,000  
Answer: B  
Explanation:  B) \( y = 34,000 + (2.40 \times 10,000) = 58,000 \)  
Diff: 3  
Terms:  high-low method, cost predictions  
Objective:  4  
AACSB:  Analytical skills

Answer the following questions using the information below:

The Barnett Company has assembled the following data pertaining to certain costs that cannot be easily identified as either fixed or variable. Barnett Company has heard about a method of measuring cost functions called the high-low method and has decided to use it in this situation.

<table>
<thead>
<tr>
<th>Cost</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>$24,900</td>
<td>5,250</td>
</tr>
<tr>
<td>24,000</td>
<td>5,500</td>
</tr>
<tr>
<td>36,400</td>
<td>7,500</td>
</tr>
<tr>
<td>44,160</td>
<td>9,750</td>
</tr>
<tr>
<td>45,000</td>
<td>9,500</td>
</tr>
</tbody>
</table>

27) What is the cost function?
A) \( y = 43,191 + 0.19X \)
B) \( y = 4,875 + 4.28X \)
C) \( y = 41,900 + 0.23X \)
D) \( y = 2,430 + 4.28X \)
Answer: D  
Explanation:  D) \( b = (44,160 - 24,900) / (9,750 - 5,250) = 4.28 \) for the highest and lowest values of the cost driver  
\( 44,160 = a + (4.28 \times 9.750) \)  
a = $2,430  
Cost function is \( Y = 2,430 + 4.28X \)  
Diff: 3  
Terms:  cost function, high-low method  
Objective:  4  
AACSB:  Analytical skills
28) What is the estimated total cost at an operating level of 8,000 hours?
A) $43,740
B) $36,670
C) $46,875
D) $37,125
Answer: B
Explanation: B) \( b = \frac{($44,160 - $24,900)}{(9,750 - 5,250)} = $4.28 \) for the highest and lowest values of the cost driver
\( $44,160 = a + ($4.28 \times 9,750) \)
a = $2,430
Cost function is \( Y = $2,430 + $4.28X \)
\( $36,670 = $2,430 + ($4.28 \times 8,000) \)
Diff: 3
Terms: high-low method, cost predictions
Objective: 4
AACSB: Analytical skills

Answer the following questions using the information below:

Presented below are the production data for the first six months of the year for the mixed costs incurred by Gallup Company.

<table>
<thead>
<tr>
<th>Month</th>
<th>Cost</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>$4,890</td>
<td>4,100</td>
</tr>
<tr>
<td>February</td>
<td>4,024</td>
<td>3,200</td>
</tr>
<tr>
<td>March</td>
<td>6,480</td>
<td>5,300</td>
</tr>
<tr>
<td>April</td>
<td>8,840</td>
<td>7,500</td>
</tr>
<tr>
<td>May</td>
<td>5,800</td>
<td>4,800</td>
</tr>
<tr>
<td>June</td>
<td>7,336</td>
<td>6,600</td>
</tr>
</tbody>
</table>

Gallup Company uses the high-low method to analyze mixed costs.

29) How would the cost function be stated?
A) \( y = $440 + $1.12X \)
B) \( y = $3,562.30 + $0.144X \)
C) \( y = $107.20 + $1.12 \)
D) \( y = $7,850 + $0.132X \)
Answer: A
Explanation: A) \( b = \frac{($8,840 - $4,024)}{(7,500 - 3,200)} = $1.12 \)
\( $8,840 = a + $1.12 \times 7,500 \)
a = $440
Cost function is \( Y =$440 + $1.12X \)
Diff: 3
Terms: high-low method, cost function
Objective: 4
AACSB: Analytical skills
30) What is the estimated total cost at an operating level of 5,000 units?
A) $6,227.20
B) $6,040.00
C) $4,283.20
D) $8,510.00
Answer: B

Explanation: B) \( b = \frac{($8,840 - $4,024)}{(7,500 - 3,200)} = $1.12 \)
\( $8,840 = a + $1.12 \times 7,500 \)
a = $440

\( y = $440 + $1.12 \times 5,000 = $6,040 \)
Diff: 3

Terms: high-low method, cost predictions
Objective: 4
AACSB: Analytical skills

Answer the following questions using the information below:

The Gangwere Company has assembled the following data pertaining to certain costs that cannot be easily identified as either fixed or variable. Gangwere Company has heard about a method of measuring cost functions called the high-low method and has decided to use it in this situation.

<table>
<thead>
<tr>
<th>Month</th>
<th>Cost</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>$40,000</td>
<td>3,500</td>
</tr>
<tr>
<td>February</td>
<td>24,400</td>
<td>2,000</td>
</tr>
<tr>
<td>March</td>
<td>31,280</td>
<td>2,450</td>
</tr>
<tr>
<td>April</td>
<td>36,400</td>
<td>3,000</td>
</tr>
<tr>
<td>May</td>
<td>44,160</td>
<td>3,900</td>
</tr>
<tr>
<td>June</td>
<td>42,400</td>
<td>3,740</td>
</tr>
</tbody>
</table>

31) How is the cost function stated?
A) \( y = $26,672 + $1.84X \)
B) \( y = $21,360 + $10.40 \)
C) \( y = $10,112 + $8.64X \)
D) \( y = $3,600 + $10.40X \)
Answer: D

Explanation: D) \( b = \frac{($44,160 - $24,400)}{(3,900 - 2,000)} = $10.40 \)
\( $44,160 = a + $10.40 \times 3,900 \)
a = $3,600
Diff: 3

Terms: cost function, high-low method
Objective: 4
AACSB: Analytical skills
32) What is the estimated total cost at an operating level of 2,850 hours?
A) $25,692  
B) $33,240  
C) $32,016  
D) $34,736  
Answer: B
Explanation: 
\[ b = \frac{($44,160 - $24,400)}{(3,900 - 2,000)} = $10.40 \]
\[ $44,160 = a + $10.40 \times 3,900 \]
\[ a = $3,600 \]
\[ y = $3,600 + $10.40 \times 2,850 = $33,240 \]
Diff: 3
Terms: high-low method, cost predictions
Objective: 4
AACSB: Analytical skills

33) Individual cost items included in the dependent variable should have the same cost driver or more than one cost function should be estimated.
Answer: TRUE
Diff: 2
Terms: cost function, dependent variable
Objective: 4
AACSB: Reflective thinking

34) The last step in estimating a cost function using quantitative analysis is to identify the independent variable.
Answer: FALSE
Explanation: The last step in estimating a cost function using quantitative analysis is to evaluate the cost driver of the estimated cost function.
Diff: 2
Terms: cost function, dependent variable
Objective: 4
AACSB: Reflective thinking

35) In estimating a cost function using quantitative analysis, the dependent variable is the factor used to predict the independent variable.
Answer: FALSE
Explanation: In estimating a cost function using quantitative analysis, the independent variable is the factor used to predict the dependent variable.
Diff: 2
Terms: cost function, dependent variable, independent variable
Objective: 4
AACSB: Reflective thinking
36) Cross-sectional data pertain to the same entity (organization, plant, activity, and so on) over successive past periods.
Answer: FALSE
Explanation: *Time-series data* pertain to the same entity (organization, plant, activity, and so on) over successive past periods.
Diff: 1
Terms: cost estimation, cost function
Objective: 4
AACSB: Reflective thinking

37) Evidence of relationships and extreme observations are highlighted when costs and their cost drivers are plotted graphically.
Answer: TRUE
Diff: 2
Terms: cost estimation, cost function
Objective: 4
AACSB: Reflective thinking

38) The most common forms of quantitative analysis are the conference method and the account analysis method.
Answer: FALSE
Explanation: The most common forms of quantitative analysis are the *high-low method* and *regression analysis*.
Diff: 1
Terms: conference, account analysis, high-low method; regression analysis
Objective: 4
AACSB: Reflective thinking

39) Regression analysis relies on only two observations to estimate a linear cost function.
Answer: FALSE
Explanation: *The high-low method* relies on only two observations to estimate a linear cost function.
Diff: 1
Terms: regression analysis, linear cost function
Objective: 4
AACSB: Reflective thinking

40) The y-intercept of a linear cost function is an accurate cost assessment of using zero machine-hours, only if zero machine-hours are within the relevant range.
Answer: TRUE
Diff: 2
Terms: linear cost function
Objective: 4
AACSB: Reflective thinking
41) A negative slope of a regression line indicates that total costs are higher for higher values of the cost driver.
Answer: FALSE
Explanation: A positive slope of a regression line indicates that costs are higher for higher values of the cost driver.
Diff: 2
Terms: regression analysis
Objective: 4
AACSB: Reflective thinking

42) The high-low method is more accurate than the regression method of estimating a cost function.
Answer: FALSE
Explanation: The regression method is more accurate than the high-low method since it uses all available data to estimate a cost function.
Diff: 1
Terms: high-low method, regression analysis
Objective: 4
AACSB: Reflective thinking

43) If inaccurate cost estimates are too low, then a company may unknowingly reward a manager for poor performance.
Answer: FALSE
Explanation: If inaccurate cost estimates are too high, then a company may unknowingly reward a manager for poor performance.
Diff: 3
Terms: cost estimation
Objective: 4
AACSB: Ethical reasoning

44) Simple regression is known as "simple" because it includes only one cost driver.
Answer: TRUE
Diff: 2
Terms: simple regression
Objective: 4
AACSB: Reflective thinking

45) The high-low method involves choosing the period of highest cost driver activity and the period of lowest cost driver activity.
Answer: TRUE
Diff: 2
Terms: high-low method
Objective: 4
AACSB: Reflective thinking
46) A strength of the high-low method of cost estimation is that the high point and the low point are representative of all data points.
Answer: FALSE
Explanation: A weakness of the high-low method of cost estimation is that the high point and the low point are not representative of all data points.
Diff: 2
Terms: high-low method
Objective: 4
AACSB: Reflective thinking

47) In regression analysis, the term "goodness of fit" indicates the strength of the relationship between the cost driver and the costs.
Answer: TRUE
Diff: 2
Terms: regression analysis
Objective: 4
AACSB: Reflective thinking

48) Multiple regression analysis estimates the relationship between the dependent variable and two or more independent variables.
Answer: TRUE
Diff: 2
Terms: cost estimation, cost predictions
Objective: 4
AACSB: Communication

49) The managers of the production department have decided to use the production levels of 2011 and 2014 as examples of the highest and lowest years of operating levels. Data for those years are as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Chemicals used</th>
<th>Overhead Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>280,000 gallons</td>
<td>$230,000</td>
</tr>
<tr>
<td>2014</td>
<td>240,000 gallons</td>
<td>$200,000</td>
</tr>
</tbody>
</table>

Required:
What is the cost estimating equation for the department if gallons of chemicals are used as the cost driver?
Answer:
Slope (variable cost) = ($230,000 - $200,000) / (280,000 - 240,000) = $0.75

Constant (fixed cost) = $200,000 - $0.75(240,000) = $20,000

Estimating equation = $20,000 + $0.75DM
Diff: 1
Terms: cost estimation, slope coefficient, constant
Objective: 4
AACSB: Analytical skills
50) Wimmer's Storage ran its freezer in February, a slow month, for 360 hours for a total cost of $57,600. In July, a peak month, the freezer ran for 720 hours for a total cost of $82,080.

**Required:**

a. What is the cost estimating equation for the department if hours of freezer use are used as the cost driver?

b. What is the estimated total cost at an operating level of 500 hours?

**Answer:**

a. Slope (variable costs) = \( \frac{(82,080 - 57,600)}{(720 - 360)} = 68 \)

Constant (fixed cost) = \( 82,080 - (720 \times 68) = 33,120 \)

Estimating equation = \( 33,120 + 68DLH \)

b. Total costs of 500 hours = \( 33,120 + 68 \times 500 = 67,120 \)

Diff: 2

Terms: cost estimation, cost function, cost predictions

Objective: 4

AACSB: Analytical skills

51) The Wildcat Company has provided the following information:

<table>
<thead>
<tr>
<th>Units of Output</th>
<th>30,000 Units</th>
<th>42,000 Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$180,000</td>
<td>$252,000</td>
</tr>
<tr>
<td>Workers' wages</td>
<td>1,080,000</td>
<td>1,512,000</td>
</tr>
<tr>
<td>Supervisors' salaries</td>
<td>312,000</td>
<td>312,000</td>
</tr>
<tr>
<td>Equipment depreciation</td>
<td>151,200</td>
<td>151,200</td>
</tr>
<tr>
<td>Maintenance</td>
<td>81,600</td>
<td>110,400</td>
</tr>
<tr>
<td>Utilities</td>
<td>384,000</td>
<td>528,000</td>
</tr>
<tr>
<td>Total</td>
<td>$2,188,800</td>
<td>$2,865,600</td>
</tr>
</tbody>
</table>

Using the high-low method and the information provided above,

a. identify the linear cost function equation and

b. estimate the total cost at 36,000 units of output.

**Answer:**

a. Variable cost = \( \frac{(2,865,600 - 2,188,800)}{(42,000 - 30,000)} = 56.40 \)

Fixed cost = \( 2,865,600 - 56.40 \times 42,000 = 496,800 \)

Cost function is \( y = 496,800 + 56.40X \)

b. Output level of 36,000 units = \( 496,800 + 56.40 \times 36,000 = 2,527,200 \) total cost

Diff: 2

Terms: linear cost function

Objective: 4

AACSB: Analytical skills
52) As part of his job as cost analyst, Max Thompson collected the following information concerning the operations of the Machining Department:

<table>
<thead>
<tr>
<th>Observation</th>
<th>Machine-hours</th>
<th>Total Operating Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>4,000</td>
<td>$45,000</td>
</tr>
<tr>
<td>February</td>
<td>4,600</td>
<td>49,500</td>
</tr>
<tr>
<td>March</td>
<td>3,800</td>
<td>45,750</td>
</tr>
<tr>
<td>April</td>
<td>4,400</td>
<td>48,000</td>
</tr>
<tr>
<td>May</td>
<td>4,500</td>
<td>49,800</td>
</tr>
</tbody>
</table>

Required:

a. Use the high-low method to determine the estimating cost function with machine-hours as the cost driver.

b. If June's estimated machine-hours total 4,200, what are the total estimated costs of the Machining Department?

Answer:

a. Slope coefficient = ($49,500 - $45,750) / (4,600 - 3,800) = $4.6875 per machine-hour

   Constant = $49,500 - ($4.6875 × 4,600) = $27,937.50

   Estimating equation = $27,937.50 + $4.6875X

b. June's estimated costs = $27,937.50 + $4.6875 × 4,200 = $47,625

Diff: 2

Terms: high-low method, cost predictions

Objective: 4

AACSB: Analytical skills

53) Tessmer Manufacturing Company produces inventory in a highly automated assembly plant in Olathe, Kansas. The automated system is in its first year of operation and management is still unsure of the best way to estimate the overhead costs of operations for budgetary purposes. For the first six months of operations, the following data were collected:

<table>
<thead>
<tr>
<th>Machine-hours</th>
<th>Kilowatt-hours</th>
<th>Total Overhead Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>3,800</td>
<td>4,520,000</td>
</tr>
<tr>
<td>February</td>
<td>3,650</td>
<td>4,340,000</td>
</tr>
<tr>
<td>March</td>
<td>3,900</td>
<td>4,500,000</td>
</tr>
<tr>
<td>April</td>
<td>3,300</td>
<td>4,290,000</td>
</tr>
<tr>
<td>May</td>
<td>3,250</td>
<td>4,200,000</td>
</tr>
<tr>
<td>June</td>
<td>3,100</td>
<td>4,120,000</td>
</tr>
</tbody>
</table>

Required:

a. Use the high-low method to determine the estimating cost function with machine-hours as the cost driver.

b. Use the high-low method to determine the estimating cost function with kilowatt-hours as the cost driver.

c. For July, the company ran the machines for 3,000 hours and used 4,000,000 kilowatt-hours of power. The overhead costs totaled $314,000. Which cost driver was the best predictor for July?
a. **Machine-hours:**
   
   Slope coefficient = \( \frac{($339,200 - $320,000)}{(3,900 - 3,100)} \)
   
   = $24.00 per machine-hour

   Constant = $339,200 - ($24 \times 3,900) = $245,600

   Machine-hour estimating equation = $245,600 + $24X

b. **Kilowatt-hours:**
   
   Slope coefficient = \( \frac{($338,000 - $320,000)}{(4,520,000 - 4,120,000)} \)
   
   = $0.045 per kilowatt-hour

   Constant = $338,000 - ($0.045 \times 4,520,000) = $134,600

   Kilowatt-hour estimating equation = $134,600 + $0.045KWH

c. **July's estimated costs:**
   
   with machine-hours = $245,600 + $24 \times 3,000 = $317,600

   with kilowatt-hours = $134,600 + $0.045 \times 4,000,000 = $314,600

   The best estimator for July was the kilowatt-hour cost driver.

54) Patrick Ross, the president of Ross's Wild Game Company, has asked for information about the cost behavior of manufacturing overhead costs. Specifically, he wants to know how much overhead cost is fixed and how much is variable. The following data are the only records available:

<table>
<thead>
<tr>
<th>Month</th>
<th>Machine-hours</th>
<th>Overhead Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>February</td>
<td>1,700</td>
<td>$20,500</td>
</tr>
<tr>
<td>March</td>
<td>2,800</td>
<td>22,250</td>
</tr>
<tr>
<td>April</td>
<td>1,000</td>
<td>19,950</td>
</tr>
<tr>
<td>May</td>
<td>2,500</td>
<td>21,500</td>
</tr>
<tr>
<td>June</td>
<td>3,500</td>
<td>23,950</td>
</tr>
</tbody>
</table>

**Required:**

Using the high-low method, determine the overhead cost equation. Use machine-hours as your cost driver.

**Answer:**

High: June 3,500 $23,950

Low: April 1,000 19,950

Difference 2,500 $4,000

Variable cost per MH: $4,000/2,500 = $1.60 per MH

Fixed cost: $19,950 = \( a + $1.60 \times 1,000 \)

\( a = $18,350 \)

Cost function is \( Y = $18,350 + $1.60X \)

**Diff:** 2

Terms: high-low method, cost function

Objective: 4

AACSB: Analytical skills
55) List and briefly describe the six steps in estimating a cost function under quantitative analysis.
Answer: The first step is to select the dependent variable. Selection of which dependent variable to use will depend on the cost function being estimated. Once the dependent variable has been selected, it is necessary to identify the independent variable or cost driver. The cost driver is the factor that is used to predict the dependent variable costs. The cost driver should have an economically plausible relationship with the dependent variable and be measurable. The third step involves collecting data on the dependent variable and the cost driver. The data may be time-series data or they may be cross-sectional data. Once the data are collected, they need to be plotted, which is step four. Plotting the data allows for the relationship between the cost driver and the dependent variable to be more readily observed. This also allows for the identification of extreme observations that should be further investigated. The fifth step is to estimate the cost function, using some form of quantitative analysis. The last step is to evaluate the cost driver of the estimated cost function to determine if the cost function provides a good estimation.
Diff: 2
Terms: cost estimation
Objective: 4
AACSB: Reflective thinking

Objective 10.5

1) An inaccurate cost function with a slope coefficient that is estimated too low may most likely result in:
A) predicting total costs that are too high
B) initiating cost cutting measures when they are unnecessary
C) evaluating a weak manager as having strong performance
D) promoting a product that is actually more profitable than budgeted
Answer: B
Diff: 3
Terms: cost function, slope coefficient
Objective: 5
AACSB: Analytical skills

2) An inaccurate cost function with a constant that is estimated too high may most likely result in:
A) evaluating a weak manager as providing strong performance
B) promoting a product that is actually less profitable than budgeted
C) predicting total costs that are too low
D) replicating processes that are truly cost saving
Answer: A
Diff: 3
Terms: cost function, cost estimation
Objective: 5
AACSB: Analytical skills
3) A cost function with a lower constant than a year ago could indicate all of the following EXCEPT:
A) last year's cost function was inaccurate
B) a new operations manager is being effective
C) the sales commission percentage has decreased
D) insurance premiums have decreased
Answer: C
Diff: 3
Terms: cost function, cost estimation
Objective: 5
AACSB: Reflective thinking

4) A cost function with a lower slope coefficient than a year ago could indicate that:
A) total variable costs have decreased
B) new cost-cutting initiatives are beneficial
C) production has decreased
D) rental costs have decreased
Answer: B
Diff: 3
Terms: cost function, cost estimation, slope coefficient
Objective: 5
AACSB: Analytical skills

5) If machine maintenance is scheduled at a time when production is at a low level, then:
A) low production is the cost driver of high repair costs
B) an understanding of operations is needed to determine an appropriate cost driver
C) low production should be avoided since it is the cause of machine maintenance
D) machine maintenance cannot be accurately predicted
Answer: B
Diff: 3
Terms: cost function, cost estimation
Objective: 5
AACSB: Reflective thinking

6) Goodness-of-fit measures how well the predicted values in a cost estimating equation:
A) match the cost driver
B) determine the level of activity
C) match the actual cost observations
D) rely on the independent variable
Answer: C
Diff: 2
Terms: cost function, cost estimation, regression analysis
Objective: 5
AACSB: Reflective thinking
7) A steeply sloped regression line indicates:
A) a strong relationship between the cost driver and costs
B) a greater proportion of fixed costs than variable costs
C) an economically plausible relationship exists
D) management should cut costs
Answer: A
Diff: 3
Terms: regression analysis, slope coefficient
Objective: 5
AACSB: Reflective thinking

8) The smaller the residual term the:
A) stronger the relationship between the cost driver and costs
B) weaker the relationship between the cost driver and costs
C) steeper the slope of the cost function
D) gentler the slope of the cost function
Answer: A
Diff: 2
Terms: regression analysis, cost function
Objective: 5
AACSB: Reflective thinking

9) When using activity-based costing all of the following are true EXCEPT that:
A) all cost drivers should be output unit-level cost drivers
B) there are a great number and variety of cost drivers and cost pools
C) industrial engineering, conference, and regression analysis can be used to estimate slope coefficients
D) the more cost pools, the greater the chance of estimation error
Answer: A
Diff: 2
Terms: cost function, cost estimation
Objective: 5
AACSB: Reflective thinking

10) When evaluating and choosing cost drivers all of the following are true EXCEPT:
A) the cost driver is economically plausible.
B) there is a significance of effect of the independent variable
C) there is an independent verification of the relationship by a committee of cost accountants
D) there is a goodness of fit between the various data points and the regression line
Answer: C
Diff: 2
Terms: cost function, cost estimation
Objective: 5
AACSB: Reflective thinking
11) Machine-hours is a more economically plausible cost driver of machine maintenance than number of direct manufacturing labor-hours.
Answer: TRUE
Diff: 2
Terms: cost function
Objective: 5
AACSB: Reflective thinking

12) The larger the vertical difference between actual costs and predicted costs the better the goodness of fit.
Answer: FALSE
Explanation: The smaller the vertical difference between actual costs and predicted costs the better the goodness of fit.
Diff: 2
Terms: residual term, regression analysis
Objective: 5
AACSB: Reflective thinking

13) Choosing an economically plausible cost driver for indirect costs is fairly simple and knowledge of operations is unnecessary.
Answer: FALSE
Explanation: Finding an economically plausible cost driver is not always simple and many times knowledge of operations is necessary.
Diff: 2
Terms: cost function
Objective: 5
AACSB: Reflective thinking

14) A flat or slightly sloped regression line indicates a strong relationship.
Answer: FALSE
Explanation: A flat or slightly sloped regression line indicates a weak relationship.
Diff: 3
Terms: regression analysis
Objective: 5
AACSB: Reflective thinking

15) To implement ABC systems, managers must identify a cost driver for each activity.
Answer: TRUE
Diff: 1
Terms: cost function, cost driver
Objective: 5
AACSB: Reflective thinking
16) Activity-based costing systems use the quantitative analysis method exclusively for cost estimation because of its accuracy.
Answer: FALSE
Explanation: Because ABC systems have a great number and variety of cost drivers and cost pools it requires many cost relationships to be estimated. ABC systems use a variety of estimation methods - industrial engineering, conference, and quantitative analysis. In making the choice of method to use, managers trade off detail, accuracy, feasibility, and costs of estimating cost functions.
Diff: 2
Terms: cost function, cost driver
Objective: 5
AACSB: Reflective thinking

17) Economic plausibility is an important criterion for choosing a cost driver.
Answer: TRUE
Diff: 1
Terms: cost function
Objective: 5
AACSB: Reflective thinking

18) What are the three criteria a company should use to evaluate and choose a cost driver? Briefly explain each of the three criteria.
Answer: The three criteria a company should use to evaluate a cost driver are economic plausibility, goodness of fit, and significance of the independent variable.

Economic plausibility involves the theoretical existence of a causal relationship between a driver and the costs it is supposed to drive.

Goodness of fit involves the observed differences between predictions of costs based on the cost driver and the actual costs that occurred.

Significance of the independent variable involves the steepness of the slope of the cost driver relative to the slope of other possible cost drivers. The steeper the slope (given the same goodness of fit) the stronger is the relationship between the cost driver and the related costs.
Diff: 2
Terms: cost function, cost estimation
Objective: 5
AACSB: Reflective thinking
Objective 10.6

1) Over the short run, a nonlinear cost function would most likely result from all of the following EXCEPT:
   A) quantity discounts for each additional 10,000 parts purchased
   B) purchasing another $250,000 printing machine to double production
   C) hiring a third production supervisor
   D) incurring greater total utility costs for each machine-hour of operation

Answer: D
Diff: 3
Terms: cost function, nonlinear cost function
Objective: 6
AACSB: Analytical skills

2) Examples of nonlinear cost functions include all of the following EXCEPT:
   A) step variable-cost functions
   B) step fixed-cost functions
   C) learning curves
   D) mixed cost functions

Answer: D
Diff: 2
Terms: nonlinear cost function
Objective: 6
AACSB: Reflective thinking

3) A step fixed-cost function:
   A) is fixed over the short run but not over the long run
   B) is often approximated with a continuous variable-cost function
   C) remains the same over a narrow range of activity
   D) example includes setup costs

Answer: A
Diff: 2
Terms: step cost function
Objective: 6
AACSB: Reflective thinking

4) A step variable-cost function:
   A) is fixed over the long run but not over the short run
   B) is often approximated with a continuous variable-cost function
   C) remains the same over a wide range of activity
   D) example includes adding additional warehouse space

Answer: B
Diff: 2
Terms: step cost function
Objective: 6
AACSB: Reflective thinking
5) A learning curve is a function:
A) that measures the decline in labor-hours per unit due to workers becoming better at a job
B) that increases at a greater rate as workers become more familiar with their tasks
C) where unit costs increase as productivity increases
D) that is linear
Answer: A
Diff: 2
Terms: learning curve
Objective: 6
AACSB: Reflective thinking

6) An experience curve:
A) is a narrower application of the learning curve
B) measures the decline in cost per unit as production decreases for various value-chain functions such as marketing as production increases
C) only measures the decline in labor-hours per unit as units produced increases
D) measures the increase in cost per unit as productivity increases
Answer: B
Diff: 2
Terms: experience curve
Objective: 6
AACSB: Reflective thinking

7) An "economy of scale" function is an example of a linear cost function.
Answer: FALSE
Explanation: A nonlinear cost function is a cost function for which the graph of total costs is not a straight line within the relevant range. In an economy of scale situation, where there is a possibility of producing double the product for less than double the cost; the function would be nonlinear.
Diff: 1
Terms: nonlinear cost function
Objective: 6
AACSB: Reflective thinking

8) A step cost function is an example of a linear cost function.
Answer: FALSE
Explanation: A step cost function is an example of a nonlinear cost function.
Diff: 1
Terms: nonlinear cost function
Objective: 6
AACSB: Reflective thinking

9) Step fixed-cost functions are variable over the long run.
Answer: TRUE
Diff: 2
Terms: nonlinear cost function, step cost function
Objective: 6
AACSB: Reflective thinking

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10) An experience curve is a function that measures the decline in cost per unit in various business functions of the value chain as the amount of these activities increases.
Answer: TRUE
Diff: 1
Terms: experience curve
Objective: 6
AACSB: Reflective thinking

11) A learning curve measures the effect of learning on efficiency.
Answer: TRUE
Diff: 1
Terms: learning curve
Objective: 6
AACSB: Reflective thinking
12) Harry's Picture manufactures various picture frames. Each new employee takes 5 hours to make the first picture frame and 4 hours to make the second. The manufacturing overhead charge per hour is $20.

**Required:**

a. What is the learning-curve percentage, assuming the cumulative average method?

b. What is the time needed to build 8 picture frames by a new employee using the cumulative average-time method? You may use an index of -0.1520.

c. What is the time needed to produce the 16th frame by a new employee using the incremental unit-time method? You may use an index of -0.3219.

d. How much manufacturing overhead would be charged to the 16 picture frames using the average-time approach?

**Answer:**

<table>
<thead>
<tr>
<th>Job</th>
<th>Hours</th>
<th>Cumulative</th>
<th>Cumulative Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>9</td>
<td>4.5</td>
</tr>
</tbody>
</table>

Learning percentage = 4.5/5 = 0.90

b. \[ Y = p \times q \]
   \[ = 5 \times 8^{-0.1520} \]
   \[ = 3.65 \text{ hours} \]

or 1 unit = 5
2 units = 5 \times 0.9 = 4.5
4 units = 4.5 \times 0.9 = 4.05
8 units = 4.05 \times 0.9 = 3.65 \text{ hours}

Time to build 8 units: 8 \times 3.65 = 29.2 \text{ hours}

c. \[ Y = p \times q \]
   \[ = 5 \times 16^{-0.3219} \]
   \[ = 2.048 \text{ hours} \]

or 1 unit = 5
2 units = 5 \times 0.8 = 4
4 units = 4 \times 0.8 = 3.2
8 units = 3.2 \times 0.8 = 2.56
16 units = 2.56 \times 0.8 = 2.048 \text{ hours}

d. Total time = 2.048 \times 16 = 32.768 \text{ hours}

Overhead charge = 32.768 \times $20 = $655.36

Diff: 3

Terms: learning curve, cumulative ave-time/inc unit-time learning model

Objective: 6

AACSB: Analytical skills
13) Each time Mayberry Nursery hires a new employee, it must wait for some period of time before the employee can meet production standards. Management is unsure of the learning curve in its operations but it knows the first job by a new employee averages 30 hours and the second job averages 24 hours. Assume all jobs to be equal in size.

**Required:**

a. What is the learning-curve percentage, assuming the cumulative average-time method?

b. What is the time for a new employee to build 16 units with this learning curve using the cumulative average-time method? You may use an index of -0.1520.

**Answer:**

a.  

<table>
<thead>
<tr>
<th>Job</th>
<th>Hours</th>
<th>Cumulative</th>
<th>Cumulative Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>2</td>
<td>24</td>
<td>54</td>
<td>27</td>
</tr>
</tbody>
</table>

Learning percentage = 27/30 = 0.90

b.  

\[ Y = p \times q \]

\[ = 30 \times 16^{-0.1520} \]

\[ = 19.683 \text{ hours} \]

or  

1 unit = 30
2 units = 30 \times 0.9 = 27
4 units = 27 \times 0.9 = 24.3
8 units = 24.3 \times 0.9 = 21.87
16 units = 21.87 \times 0.9 = 19.683 \text{ hours}

16 \times 19.683 = 314.9 \text{ hours}

Diff: 2

Terms: learning curve, cumulative average-time learning model

Objective: 6

AACSB: Analytical skills
14) Joe's Copy Center hires a new employee. Joe knows he has to be patient with the employee until the employee gains enough experience to meet production standards. Joe is unsure of the learning curve in his operation, but he knows the first job by a new employee averages 40 minutes and the second job averages 32 minutes. Assume all jobs to be equal in size.

**Required:**

a. What is the learning-curve percentage, assuming the cumulative average-time method?

b. What is the time for a new employee to do 32 jobs with this learning curve using the cumulative average-time method? You may use an index of -0.1520.

**Answer:**

a. | Job | Minutes | Cumulative | Cumulative Average |
---|------|----------|-------------|
| 1  | 40   | 40       | 40          |
| 2  | 32   | 72       | 36          |

Learning percentage = 36/40 = 0.90

b. \[ Y = p \times q \]

= 40 × 16⁻₀.₁₅₂₀

= 23.62 minutes

or 1 unit = 40

2 units = 40 × 0.9 = 36

4 units = 36 × 0.9 = 32.4

8 units = 32.4 × 0.9 = 29.16

16 units = 29.16 × 0.9 = 26.244

32 units = 26.244 × 0.9 = 23.62 minutes

32 × 23.62 = 755.827 minutes = Approximately 12 hours and 36 minutes

Diff: 2

Terms: learning curve, cumulative average-time learning model

Objective: 6

AACSB: Analytical skills

15) Discuss the potential use of nonlinear curves in cost functions and cost analysis. Give some examples.

**Answer:** Cost functions are not always linear. A nonlinear cost function is a cost function for which the graph of total costs is not a straight line within the relevant range of operations. One example is a series of straight line segments that change their slopes at critical intersection points within the range of operation. Another example would be a step function. A step function is a function where the cost remains the same over various ranges of the level of activity, but the cost increases by discrete amounts (or steps) as the level of activity advances from one range to another. In addition to the examples mentioned above, there are situations where the cost or use of resources can be represented by a curve instead of a single straight line or a group of segmented straight lines. One example of a curve is a learning curve. A learning curve is a function that measures how labor-hours per unit decline as units of production increase because workers are learning and becoming better at their jobs.

Diff: 2

Terms: nonlinear cost function

Objective: 6

AACSB: Reflective thinking
Objective 10.7

1) To complete the first setup on a new machine took an employee 100 minutes. Using an 80% cumulative average-time learning curve indicates that the second setup on the new machine is expected to take:
   A) 80 minutes
   B) 60 minutes
   C) 40 minutes
   D) 30 minutes
   Answer: B
   Explanation: B) 100 × .80 = 80; (100 + X)/2 = 80; X = 60 minutes
   Diff: 3
   Terms: learning curve, cumulative average-time learning model
   Objective: 7
   AACSB: Analytical skills

2) To complete the first setup on a new machine took an employee 200 minutes. Using an 80% incremental unit-time learning model indicates that the second setup on the new machine is expected to take:
   A) 160 minutes
   B) 120 minutes
   C) 80 minutes
   D) 60 minutes
   Answer: A
   Explanation: A) 200 × .80 = 160 minutes
   Diff: 2
   Terms: learning curve, incremental unit-time learning model
   Objective: 7
   AACSB: Analytical skills

3) Learning curve effects can be incorporated:
   A) into performance evaluations
   B) into production schedules
   C) when using costs to price products
   D) All of these answers are correct.
   Answer: D
   Diff: 2
   Terms: learning curve
   Objective: 7
   AACSB: Reflective thinking
4) The learning-curve models presented in the text examine:
A) how quality increases over time
B) how efficiency increases as more units are produced
C) how setup costs decline as more workers are added
D) the change in variable costs when quantity discounts are available
Answer:  B
Diff: 2
Terms:  learning curve
Objective:  7
AACSB:  Reflective thinking

5) Plotting learning curve observations is helpful in selecting the appropriate learning curve model.
Answer:  TRUE
Diff: 1
Terms:  learning curve
Objective:  7
AACSB:  Reflective thinking

6) When new products are introduced, learning-curve effects can have a major influence on production scheduling.
Answer:  TRUE
Diff: 2
Terms:  learning curve
Objective:  7
AACSB:  Reflective thinking

7) It is appropriate to incorporate expected learning-curve efficiencies when evaluating performance.
Answer:  TRUE
Diff: 1
Terms:  learning curve
Objective:  7
AACSB:  Ethical reasoning

8) The cumulative average-time learning model with a 80% learning curve indicates that if it takes 100 minutes to manufacture the first unit of a new model, then the second unit will take only 80 minutes to manufacture.
Answer:  FALSE
Explanation:  100 × .80 = 80; (100 + X)/2 = 80; X = 60 minutes
Diff: 3
Terms:  learning curve, cumulative average-time learning model
Objective:  7
AACSB:  Reflective thinking
9) The incremental unit-time learning model with a 90% learning curve indicates that if it takes 100 minutes to manufacture the first unit of a new model, then the second unit will take only 90 minutes to manufacture.
Answer: TRUE
Diff: 2
Terms: incremental unit-time learning model
Objective: 7
AACSB: Reflective thinking

10) A learning curve is a function that measures how labor-hours per unit decrease, as units of production decrease.
Answer: FALSE
Explanation: A learning curve is a function that measures how labor-hours per unit decrease, as units of production increase.
Diff: 2
Terms: learning curve
Objective: 7
AACSB: Reflective thinking

11) Explain the difference between the cumulative average-time learning model and the incremental unit-time learning model.
Answer: In the cumulative average-time learning model, cumulative average time per unit declines by a constant percentage each time the cumulative quantity of units produced doubles.
In the incremental unit-time learning model, incremental time needed to produce the last unit declines by a constant percentage each time the cumulative quantity of units produced doubles.
Diff: 2
Terms: learning curve, cumulative ave-time/inc unit-time learning model
Objective: 7
AACSB: Reflective thinking

Objective 10.8

1) The ideal database contains:
A) numerous cost driver observations
B) reliably measured observations
C) cost driver observations spanning a wide range
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: cost estimation
Objective: 8
AACSB: Reflective thinking
2) Data collection problems arise when:
A) data are recorded electronically rather than manually
B) accrual-basis costs are used rather than cash-basis costs
C) fixed and variable costs are not separately identified and both are allocated to products on a per unit basis
D) purely inflationary price effects are removed
Answer: C
Diff: 3
Terms: cost estimation
Objective: 8
AACSB: Reflective thinking

3) Managers who design data collection reports that regularly and routinely obtain required data are helping to ensure that:
A) inflationary effects are removed
B) all data are recorded
C) extreme values are not used to calculate cost functions
D) the relationship between the cost driver and the cost remains stable over time
Answer: B
Diff: 2
Terms: cost estimation
Objective: 8
AACSB: Reflective thinking

4) Extreme values of observations may be the result of:
A) a misplaced decimal point in the recorded data
B) classifying a cost incorrectly
C) a temporary plant shutdown
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: cost estimation
Objective: 8
AACSB: Reflective thinking

5) All of the following are cost analysis problems EXCEPT:
A) fixed costs are allocated as if they are variable costs
B) extreme observations are adjusted or removed
C) time periods differ for measuring items included in the dependent variable and the cost driver(s)
D) homogeneous relationships between individual cost items in the dependent variable pool and cost drivers may not be present
Answer: B
Diff: 3
Terms: cost estimation
Objective: 8
AACSB: Reflective thinking
6) Data collection problems can arise when data is recorded manually rather than electronically.  
Answer: TRUE  
Diff: 1  
Terms: cost estimation  
Objective: 8  
AACSB: Use of Information Technology

7) Misinterpretation of data can arise when fixed costs are reported on a per unit basis.  
Answer: TRUE  
Diff: 2  
Terms: cost estimation  
Objective: 8  
AACSB: Reflective thinking

8) Inflation can distort data that are compared over time so purely inflationary effects should be removed.  
Answer: TRUE  
Diff: 2  
Terms: cost estimation  
Objective: 8  
AACSB: Reflective thinking

9) Fixed costs are sometimes allocated to individual products as part of the standard costing system. When this is the case, they should be treated as variable costs for purposes of future cost estimation.  
Answer: FALSE  
Explanation: The danger is to regard these costs as variable rather than fixed. The analyst should distinguish carefully fixed costs from variable costs and not treat allocated fixed cost per unit as a variable cost.  
Diff: 2  
Terms: cost estimation  
Objective: 8  
AACSB: Reflective thinking
10) Roger Moon has just purchased the film studio of a movie company that specializes in comedies. He found that the company did not try to estimate the cost of making a movie. Instead, it just gave the producer a budget and told him/her to make a movie within budget. Mr. Moon does not like the former movie-budget concept and desires to establish a formal cost estimation system.

**Required:**
What are some of the potential problems that may be encountered in changing from a budget to a cost estimation movie making system?

**Answer:** One of the first problems will be the timing of matching the cost drivers with the actual movie production process. Under the former budget system, the relationships with many of the cost drivers were probably forced to meet budget, or else poorly kept because they were substantially under budget and control over them was weak.

Next will be the problem of determining which costs are fixed and which are variable under the budget system. It may be difficult to determine those that are truly variable.

Timing problems will also have to be reconciled. Some costs may be incurred monthly rather than by movie, and some type of accrual will have to be made to keep the costs allocated to the proper cost driver.

Finally, there may be gaps in the historical data because only total costs had to be maintained within the budget. There was probably little attention paid to cost categories, thereby causing reliable cost data to be scarce.

**Objective 10.A**

1) The coefficient of determination is important in explaining variances in estimating equations. For a certain estimating equation, the unexplained variation was given as 26,505. The total variation was given as 46,500. What is the coefficient of determination for the equation?

A) 0.34  
B) 0.43  
C) 0.57  
D) 0.66

**Answer:** B  
**Explanation:** B) \( r^2 = 1 - \frac{26,505}{46,500} = 0.43 \)  
**Diff:** 2  
**Terms:** coefficient of determination \((r^2)\)  
**Objective:** A  
**AACSB:** Analytical skills
2) The Bhaskara Corporation used regression analysis to predict the annual cost of indirect materials. The results were as follows:

### Indirect Materials Cost Explained by Units Produced

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>$21,890</td>
</tr>
<tr>
<td>Standard error of Y estimate</td>
<td>$4,560</td>
</tr>
<tr>
<td>r²</td>
<td>0.7832</td>
</tr>
<tr>
<td>Number of observations</td>
<td>22</td>
</tr>
<tr>
<td>X coefficient(s)</td>
<td>11.75</td>
</tr>
<tr>
<td>Standard error of coefficient(s)</td>
<td>2.1876</td>
</tr>
</tbody>
</table>

What is the linear cost function?
A) Y = $21,890 + $11.75X
B) Y = $4,560 + $5.15X
C) Y = $20,100 + $4.60X
D) None of these answers is correct.
Answer: A

3) Craig's Cola was to manufacture 1,000 cases of cola next week. The accountant provided the following analysis of total manufacturing costs.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>100</td>
<td>71.94</td>
<td>1.39</td>
</tr>
<tr>
<td>Independent variable</td>
<td>200</td>
<td>91.74</td>
<td>2.18</td>
</tr>
</tbody>
</table>

r² = 0.82

What is the estimated cost of producing the 1,000 cases of cola?
A) $200,100
B) $142,071
C) $100,200
D) $9,000
Answer: A
Explanation: A) y = $100 + ($200 × 1,000) = $200,100

Terms: simple regression, cost function
Objective: A
AACSB: Analytical skills
4) Pam's Stables used two different independent variables (trainer hours and number of horses) in two different equations to evaluate the cost of training horses. The most recent results of the two regressions are as follows:

**Trainer's hours:**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>$913.32</td>
<td>$198.12</td>
<td>4.61</td>
</tr>
<tr>
<td>Independent Variable</td>
<td>$20.90</td>
<td>$2.94</td>
<td>7.11</td>
</tr>
</tbody>
</table>

\[ r^2 = 0.56 \]

**Number of horses:**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>$4,764.50</td>
<td>$1,073.09</td>
<td>4.44</td>
</tr>
<tr>
<td>Independent Variable</td>
<td>$864.98</td>
<td>$247.14</td>
<td>3.50</td>
</tr>
</tbody>
</table>

\[ r^2 = 0.63 \]

What is the estimated total cost for the coming year if 16,000 trainer hours are incurred and the stable has 400 horses to be trained, based on the best cost driver?

A) $99,929.09  
B) $350,756.50  
C) $335,313.32  
D) $13,844,444.50  

Answer: B  
Explanation: B) \( y = 4,764.50 + 864.98 \times 400 = 350,756.50 \) based on highest \( r^2 \), which uses # of horses as the cost driver.

Diff: 3  
Terms: simple regression, cost predictions  
Objective: A  
AACSB: Analytical skills

5) A major concern that arises with multiple regression is multicollinearity, which exists when:

A) in simple regression, when the dependent variable is not normally distributed  
B) in simple regression, when the R2 statistic is low  
C) in multiple regression, when the R2 statistic is low  
D) in multiple regression, when two or more independent variables are correlated with one another

Answer: D  
Diff: 2  
Terms: multiple regression, multicollinearity  
Objective: A  
AACSB: Analytical skills
6) In multiple regression, when two or more independent variables are correlated with one another, the situation is known as:
A) heteroscedasticity
B) homoscedasticity
C) multicollinearity
D) autocorrelation
Answer: C
Diff: 2
Terms: multiple regression, multicollinearity
Objective: A
AACSB: Reflective thinking

7) The coefficient of determination \( r^2 \) measures the percentage of variation in \( X \) (the independent variable) explained by \( Y \) (the dependent variable).
Answer: FALSE
Explanation: The coefficient of determination \( r^2 \) measures the percentage of variation in \( Y \) (the dependent variable) explained by \( X \) (the independent variable).
Diff: 1
Terms: coefficient of determination (\( r^2 \)), regression analysis
Objective: A
AACSB: Reflective thinking

8) Generally a coefficient of determination \( r^2 \) that is higher than 0.30 indicates a goodness of fit.
Answer: TRUE
Diff: 2
Terms: coefficient of determination \( r^2 \), regression analysis
Objective: A
AACSB: Reflective thinking

9) Multicollinearity is a concern in multiple regression but NOT a concern in simple regression.
Answer: TRUE
Diff: 2
Terms: simple regression, multicollinearity
Objective: A
AACSB: Reflective thinking

10) Multicollinearity exists in multiple regression when two or more independent variables are highly correlated with each other.
Answer: TRUE
Diff: 2
Terms: multiple regression, multicollinearity
Objective: A
AACSB: Reflective thinking

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11) The new cost analyst in your accounting department has just received a computer-generated report that contains the results of a simple regression program for cost estimation. The summary results of the report appear as follows:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>$71.23</td>
<td>$16.02</td>
<td>2.24</td>
</tr>
<tr>
<td>Independent variable</td>
<td>$1,030.25</td>
<td>$205.40</td>
<td>2.74</td>
</tr>
</tbody>
</table>

\[ r^2 = 0.75 \]

**Required:**

a. What is the cost estimation equation according to the report?
b. What is the goodness of fit? What does it tell about the estimating equation?

**Answer:**

a. \( y = 71.23 + 1,030.25X \)

b. Goodness of fit is 0.75. It measures how well the predicted values match the actual observations. In this case, the equation passes the goodness of fit test because it is substantially above 0.30, the threshold of acceptance.

**Diff:** 1

**Terms:** cost estimation, simple regression

**Objective:** A

**AACSB:** Use of Information Technology
12) Newton Company used least squares regression analysis to obtain the following output:

**Payroll Department Cost**

<table>
<thead>
<tr>
<th>Explained by Number of Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
</tr>
<tr>
<td>Standard error of Y estimate</td>
</tr>
<tr>
<td>$r^2$</td>
</tr>
<tr>
<td>Number of observations</td>
</tr>
<tr>
<td>X coefficient(s)</td>
</tr>
<tr>
<td>Standard error of coefficient(s)</td>
</tr>
</tbody>
</table>

**Required:**

a. What is the total fixed cost?
b. What is the variable cost per employee?
c. Prepare the linear cost function.
d. What is the coefficient of determination? Comment on the goodness of fit.

**Answer:**

a. The constant or intercept is the total fixed cost of $5,800.
b. The variable cost per employee is the X coefficient of $1.902.
c. $y = 5,800 + 1.902X$
d. The coefficient of determination is the $r^2$ of 0.8924. This represents a very high goodness of fit. The closer to 1.0, the better the cost driver explains the cost. Therefore, the conclusion can be drawn that there is a significant relationship between the cost of the payroll department and the number of employees.

**Diff: 2**

**Terms:** cost estimation, simple regression, coefficient of determination ($r^2$)

**Objective:** A

**AACSB:** Analytical skills
13) Schotte Manufacturing Company uses two different independent variables (machine-hours and number of packages) in two different equations to evaluate costs of the packaging department. The most recent results of the two regressions are as follows:

**Machine-hours:**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>$748.30</td>
<td>$341.20</td>
<td>2.19</td>
</tr>
<tr>
<td>Independent Variable</td>
<td>$52.90</td>
<td>$35.20</td>
<td>1.50</td>
</tr>
</tbody>
</table>

\[ r^2 = 0.33 \]

**Number of packages:**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>$242.90</td>
<td>$75.04</td>
<td>3.24</td>
</tr>
<tr>
<td>Independent Variable</td>
<td>$5.60</td>
<td>$2.00</td>
<td>2.80</td>
</tr>
</tbody>
</table>

\[ r^2 = 0.73 \]

**Required:**

a. What are the estimating equations for each cost driver?

b. Which cost driver is best and why?

**Answer:**

a. Machine-hours  \[ y = 748.30 + 52.90X \]  
   Number of packages \[ y = 242.90 + 5.60X \]

b. Machine-hours has a low \( r^2 \) which implies that a small proportion of the variance is explained by machine-hours, thereby making it less attractive than number of packages as a cost predictor.

Also, for the independent variable, number of packages, the t-value of 2.80 indicates that a relationship exists between the independent and dependent variables. For machine-hours, the t-value (1.50) is below 2.00, indicating that the coefficient is not significantly different from zero and that there may not be a relationship between the independent and dependent variables.

The t-values of the constant terms (\( g \)) for both drivers is greater than 2.00, therefore, there is no distinguishing characteristic between the constants.

Given the above findings, it appears that number of packages is the best predictor of costs of the packing department.

Diff: 2  
Terms: cost estimation, simple regression, coefficient of determination (\( r^2 \))  
Objective: A  
AACSB: Analytical skills
14) Arfaei Company manufactures chairs. Because the efforts of manufacturing are approximately equal between labor and machinery, management is considering other possible cost drivers. By considering different cost drivers, it is anticipated that the estimating process can be improved. The following cost estimating equations with their $r^2$ values have been determined for 20X5:

1. $X = \text{cutting time} \quad y = 19,500 + 20X \quad r^2 = 0.65$
2. $X = \text{labor} \quad y = 5,000 + 25X \quad r^2 = 0.49$
3. $X = \text{machinery} \quad y = 44,500 + 5X \quad r^2 = 0.55$

**Required:**
a. Which equation should be selected for the analysis?
b. What other factors should be included in the selection of the estimating equation?

**Answer:**
a. Equation 1 for cutting time is slightly better than the other two equations based on $r^2$ values. Generally, an $r^2$ above 0.30 indicates a goodness of fit that is acceptable for most situations. Therefore, all three equations are acceptable when considering only the coefficient of determination.

However, because the values are so close together, other factors should be considered.

b. Other factors to be considered are economic plausibility, the significance of independent variables, and specification analysis. The best cost drivers of the dependent variables are those that meet all these criteria plus that of best coefficient of determination.

**Diff:** 2
**Terms:** simple regression, coefficient of determination ($r^2$)
**Objective:** A
**AACSB:** Analytical skills
Cost Accounting, 14e (Horngren/Datar/Rajan)
Chapter 11  Decision Making and Relevant Information

Objective 11.1

1) A decision model involves:
A) only quantitative analyses
B) both quantitative and qualitative analyses
C) only qualitative analyses
D) a manager's instinct
Answer: B
Diff: 1
Terms: decision model
Objective: 1
AACSB: Reflective thinking

2) Feedback regarding previous actions may affect:
A) future predictions
B) implementation of the decision
C) the decision model
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: decision model
Objective: 1
AACSB: Reflective thinking

3) Place the following steps from the five-step decision process in order:
   A = Make predictions about future costs
   B = Evaluate performance to provide feedback
   C = Implement the decision
   D = Choose an alternative
A) A D B C
B) C D A B
C) A D C B
D) D C B A
Answer: C
Diff: 2
Terms: decision model
Objective: 1
AACSB: Reflective thinking
4) The formal process of choosing between alternatives is known as a(n):
A) relevant model
B) decision model
C) alternative model
D) prediction model
Answer: B
Diff: 1
Terms: decision model
Objective: 1
AACSB: Reflective thinking

5) Ruttles Circuit Company manufactures circuit boards for other firms. Management is attempting to search for ways to reduce manufacturing labor costs and has received a proposal from a consulting company to rearrange the production floor next year. Using the information below regarding current operations and the new proposal, which of the following decisions should management accept?

<table>
<thead>
<tr>
<th></th>
<th>Currently</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required machine operators</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Materials-handling workers</td>
<td>1.50</td>
<td>1.50</td>
</tr>
<tr>
<td>Employee average pay</td>
<td>$10 per hour</td>
<td>$12 per hour</td>
</tr>
<tr>
<td>Hours worked per employee</td>
<td>2,100</td>
<td>2,000</td>
</tr>
</tbody>
</table>

A) Do not change the production floor.
B) Rearrange the production floor.
C) Either, because it makes no difference to the employees.
D) It doesn't matter because the costs incurred will remain the same.
Answer: B
Explanation: B) Current operations: 4 workers × 2,100 hours × $10.00 = $84,000
Proposal: 3 workers × 2,000 hours × $12.00 = $72,000
Diff: 2
Terms: decision model
Objective: 1
AACSB: Analytical skills
Answer the following questions using the information below:

Schwimmer Lighting manufactures small flashlights and is considering raising the price by 50 cents a unit for the coming year. With a 50-cent price increase, demand is expected to fall by 6,000 units.

<table>
<thead>
<tr>
<th></th>
<th>Currently</th>
<th>Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand</td>
<td>40,000 units</td>
<td>34,000 units</td>
</tr>
<tr>
<td>Selling price</td>
<td>$4.50</td>
<td>$5.00</td>
</tr>
<tr>
<td>Incremental cost per unit</td>
<td>$3.00</td>
<td>$3.00</td>
</tr>
</tbody>
</table>

6) If the price increase is implemented, operating profit is projected to:
A) increase by $8,000
B) decrease by $8,000
C) increase by $12,000
D) decrease by $9,000
Answer: A
Explanation: A) \(34,000 \times (5 - 3)\) - \(40,000 \times (4.50 - 3.00)\) = increase of $8,000
Diff: 2
Terms: decision model
Objective: 1
AACSB: Analytical skills

7) Would you recommend the 50-cent price increase?
A) No, because demand decreased.
B) No, because the selling price increases.
C) Yes, because contribution margin per unit increases.
D) Yes, because operating profits increase.
Answer: D
Diff: 2
Terms: decision model
Objective: 1
AACSB: Analytical skills

8) When using the five-step decision process, which one of the following steps should be done last?
A) Obtain information
B) Choose an alternative
C) Evaluation and feedback
D) Implementing the decision
Answer: C
Diff: 2
Terms: decision model
Objective: 1
AACSB: Reflective thinking
9) When using the five-step decision process, which one of the following steps should be done first?
A) Obtain information
B) Choose an alternative
C) Evaluation and feedback
D) Implementing the decision
Answer: A
Diff: 2
Terms: decision model
Objective: 1
AACSB: Reflective thinking

10) A decision model is a formal method for making a choice, frequently involving both quantitative and qualitative analyses.
Answer: TRUE
Diff: 1
Terms: decision model, quantitative factors, qualitative factors
Objective: 1
AACSB: Reflective thinking

11) Feedback from previous decisions uses historical information and, therefore, is irrelevant for making future predictions.
Answer: FALSE
Explanation: Historical costs may be helpful in making future predictions, but are not relevant costs for decision making.
Diff: 2
Terms: relevant costs
Objective: 1
AACSB: Communication
12) The textbook discusses a five-step decision process. Briefly explain each of the five steps.
Answer: The five step decision process is (a) obtain information, (b) make predictions, (c) choose an
alternative, (d) implement the decision, and (e) evaluate performance to provide feedback.

Obtaining information involves collecting all data pertinent to the decision situation, both quantitative
and qualitative, and determining which information is relevant to the decision, and determining which
alternatives are being considered.

Making predictions involves using the information obtained above and attempting to predict what the
future costs and benefits will be for each of the various alternatives.

Choosing an alternative involves comparing the predicted benefits of each alternative with each of the
predicted costs (as well as other non-quantitative factors), and selecting an alternative that maximizes
the difference between the expected benefits and the expected costs.

Implementing the decision involves actually doing the alternative selected above and making all the
necessary changes in operations to support the decision.

Evaluating the performance of the decision involves learning from the results of the decision and seeing
which predictions were accurate and determining how to avoid any difficulties encountered in either the
decision-process or the implementation.

1) For decision making, a listing of the relevant costs:
   A) will help the decision maker concentrate on the pertinent data
   B) will only include future costs
   C) will only include costs that differ among alternatives
   D) All of these answers are correct.
   Answer: D
   Diff: 2
   Terms: relevant costs
   Objective: 2
   AACSB: Reflective thinking

2) Sunk costs:
   A) are historical costs
   B) cannot be changed
   C) are never relevant
   D) all of the above
   Answer: D
   Diff: 2
   Terms: sunk costs
   Objective: 2
   AACSB: Reflective thinking
3) Sunk costs:
A) are relevant
B) are differential
C) have future implications
D) are ignored when evaluating alternatives
Answer: D
Diff: 1
Terms: relevant costs, sunk costs
Objective: 2
AACSB: Reflective thinking

4) A car purchased last year is an example of a(n):
A) sunk cost
B) relevant cost
C) differential cost
D) avoidable cost
Answer: A
Diff: 1
Terms: sunk costs
Objective: 2
AACSB: Use of Information Technology

5) Costs that CANNOT be changed by any decision made now or in the future are:
A) fixed costs
B) indirect costs
C) avoidable costs
D) sunk costs
Answer: D
Diff: 1
Terms: sunk costs
Objective: 2
AACSB: Reflective thinking

6) In evaluating different alternatives, it is useful to concentrate on:
A) variable costs
B) fixed costs
C) total costs
D) relevant costs
Answer: D
Diff: 1
Terms: relevant costs
Objective: 2
AACSB: Reflective thinking
7) Which of the following costs always differ among future alternatives?
A) fixed costs
B) historical costs
C) relevant costs
D) variable costs
Answer: C
Diff: 1
Terms: relevant costs
Objective: 2
AACSB: Reflective thinking

8) Which of the following costs are NEVER relevant in the decision-making process?
A) fixed costs
B) historical costs
C) relevant costs
D) variable costs
Answer: B
Diff: 1
Terms: relevant costs
Objective: 2
AACSB: Reflective thinking

Answer the following questions using the information below:

John's 8-year-old Chevrolet Trail Blazer requires repairs estimated at $6,000 to make it roadworthy again. His wife, Sherry, suggested that he should buy a 5-year-old used Jeep Grand Cherokee instead for $6,000 cash. Sherry estimated the following costs for the two cars:

<table>
<thead>
<tr>
<th></th>
<th>Trail Blazer</th>
<th>Grand Cherokee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acquisition cost</td>
<td>$25,000</td>
<td>$6,000</td>
</tr>
<tr>
<td>Repairs</td>
<td>$6,000</td>
<td></td>
</tr>
<tr>
<td>Annual operating costs</td>
<td>$2,280</td>
<td>$2,100</td>
</tr>
<tr>
<td>(Gas, maintenance, insurance)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9) The cost NOT relevant for this decision is the:
A) acquisition cost of the Trail Blazer
B) acquisition cost of the Grand Cherokee
C) repairs to the Trail Blazer
D) annual operating costs of the Grand Cherokee
Answer: A
Diff: 2
Terms: relevant costs
Objective: 2
AACSB: Analytical skills
10) What should John do? What are his savings in the first year?
A) Buy the Grand Cherokee; $8,100
B) Fix the Trail Blazer; $3,180
C) Buy the Grand Cherokee; $180
D) Fix the Trail Blazer; $6,280
Answer: C
Explanation: C) Trail Blazer ($6,000 + $2,280) - Grand Cherokee ($6,000 + $2,100) = $180 cost savings with the Grand Cherokee option
Diff: 2
Terms: relevant costs
Objective: 2
AACSB: Analytical skills

11) A relevant revenue is a revenue that is a(n):
A) past revenue
B) future revenue
C) in-hand revenue
D) earned revenue
Answer: B
Diff: 2
Terms: relevant revenues
Objective: 2
AACSB: Reflective thinking

12) A relevant cost is a cost that is a (n):
A) future cost
B) past cost
C) sunk cost
D) non-cash expense
Answer: A
Diff: 2
Terms: relevant costs
Objective: 2
AACSB: Reflective thinking

13) Relevant information has all of these characteristics EXCEPT:
A) past costs are irrelevant
B) all future revenues and expenses are relevant
C) different alternatives can be compared by examining differences in total revenue and expenses
D) qualitative factors should be considered
Answer: B
Diff: 2
Terms: relevant revenues, relevant costs
Objective: 2
AACSB: Reflective thinking
14) Quantitative factors:
A) include financial information, but not nonfinancial information
B) can be expressed in monetary terms
C) are always relevant when making decisions
D) include employee morale
Answer: B
Diff: 2
Terms: quantitative factors
Objective: 2
AACSB: Reflective thinking

15) Qualitative factors:
A) generally are easily measured in quantitative terms
B) are generally irrelevant for decision making
C) may include either financial or nonfinancial information
D) include customer satisfaction
Answer: D
Diff: 2
Terms: qualitative factors
Objective: 2
AACSB: Reflective thinking

16) Historical costs are helpful:
A) for making future predictions
B) for decision making
C) because they are quantitative
D) None of these answers is correct.
Answer: A
Diff: 2
Terms: relevant costs
Objective: 2
AACSB: Reflective thinking

17) When making decisions:
A) quantitative factors are the most important
B) qualitative factors are the most important
C) appropriate weight must be given to both quantitative and qualitative factors
D) both quantitative and qualitative factors are unimportant
Answer: C
Diff: 2
Terms: qualitative factors, quantitative factors
Objective: 2
AACSB: Ethical reasoning
18) Employee morale at Dos Santos, Inc., is very high. This type of information is known as a:
A) qualitative factor
B) quantitative factor
C) nonmeasurable factor
D) financial factor
Answer: A
Diff: 1
Terms: qualitative factors
Objective: 2
AACSB: Reflective thinking

19) Roberto owns a small body shop. His major costs include labor, parts, and rent. In the decision-making process, these costs are considered to be:
A) fixed
B) qualitative factors
C) quantitative factors
D) variable
Answer: C
Diff: 1
Terms: qualitative factors
Objective: 2
AACSB: Reflective thinking

20) One-time-only special orders should only be accepted if:
A) incremental revenues exceed incremental costs
B) differential revenues exceed variable costs
C) incremental revenues exceed fixed costs
D) total revenues exceed total costs
Answer: A
Diff: 3
Terms: one-time-only special order, incremental revenue
Objective: 2
AACSB: Reflective thinking

21) When deciding to accept a one-time-only special order from a wholesaler, management should do all of the following EXCEPT:
A) analyze product costs
B) consider the special order's impact on future prices of their products
C) determine whether excess capacity is available
D) verify past design costs for the product
Answer: D
Diff: 3
Terms: one-time-only special order
Objective: 2
AACSB: Reflective thinking
22) When there is excess capacity, it makes sense to accept a one-time-only special order for less than the current selling price when:
A) incremental revenues exceed incremental costs
B) additional fixed costs must be incurred to accommodate the order
C) the company placing the order is in the same market segment as your current customers
D) it never makes sense
Answer: A
Diff: 3
Terms: one-time-only special order, incremental cost, incremental revenue
Objective: 2
AACSB: Reflective thinking

23) Full cost of the product is:
A) the sum of fixed costs in all the business functions of the value chain
B) the sum of variable costs in all the business functions of the value chain
C) the sum of all variable and fixed costs in all the business functions of the value chain
D) the sum of all costs in the value chain minus marketing costs
Answer: C
Diff: 3
Terms: full costs of the product
Objective: 2
AACSB: Reflective thinking
Kolar Manufacturing is approached by a European customer to fulfill a one-time-only special order for a product similar to one offered to domestic customers. Kolar Manufacturing has excess capacity. The following per unit data apply for sales to regular customers:

<table>
<thead>
<tr>
<th>Variable costs:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$80</td>
</tr>
<tr>
<td>Direct labor</td>
<td>40</td>
</tr>
<tr>
<td>Manufacturing support</td>
<td>70</td>
</tr>
<tr>
<td>Marketing costs</td>
<td>30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Fixed costs:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufacturing support</td>
<td>90</td>
</tr>
<tr>
<td>Marketing costs</td>
<td>30</td>
</tr>
</tbody>
</table>

Total costs: $340

Markup (50%): $170

Targeted selling price: $510

24) What is the full cost of the product per unit?
   A) $220
   B) $340
   C) $510
   D) $170
   Answer: B
   Explanation: B) $80 + $40 + $70 + $30 + $90 + $30 = $340
   Diff: 3
   Terms: full costs of the product
   Objective: 2
   AACSB: Analytical skills

25) What is the contribution margin per unit?
   A) $170
   B) $220
   C) $290
   D) $510
   Answer: C
   Explanation: C) $510 - ($80 + $40 + $70 + $30) = $290
   Diff: 3
   Terms: one-time-only special order
   Objective: 2
   AACSB: Analytical skills
26) For Kolar Manufacturing, what is the minimum acceptable price of this special order?
A) $220
B) $290
C) $340
D) $510
Answer: A
Explanation: A) $80 + $40 + $70 + $30 = $220
Diff: 3
Terms: one-time-only special order
Objective: 2
AACSB: Analytical skills

27) What is the change in operating profits if the one-time-only special order for 1,000 units is accepted for $360 a unit by Kolar?
A) $140,000 increase in operating profits
B) $20,000 increase in operating profits
C) $20,000 decrease in operating profits
D) $150,000 decrease in operating profits
Answer: A
Explanation: A) $360 - ($80 + $40 + $70 + $30) = $140; 1,000 × $140 = $140,000 increase
Diff: 3
Terms: one-time-only special order
Objective: 2
AACSB: Analytical skills

28) Ratzlaff Company has a current production level of 20,000 units per month. Unit costs at this level are:

<table>
<thead>
<tr>
<th>Cost Component</th>
<th>Cost per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$0.25</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.40</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>0.15</td>
</tr>
<tr>
<td>Fixed overhead</td>
<td>0.20</td>
</tr>
<tr>
<td>Marketing - fixed</td>
<td>0.20</td>
</tr>
<tr>
<td>Marketing/distribution - variable</td>
<td>0.40</td>
</tr>
</tbody>
</table>

Current monthly sales are 18,000 units. Jim Company has contacted Ratzlaff Company about purchasing 1,500 units at $2.00 each. Current sales would NOT be affected by the one-time-only special order, and variable marketing/distribution costs would NOT be incurred on the special order. What is Ratzlaff Company's change in operating profits if the special order is accepted?
A) $400 increase in operating profits
B) $400 decrease in operating profits
C) $1,800 increase in operating profits
D) $1,800 decrease in operating profits
Answer: C
Explanation: C) Manufacturing cost per unit = $0.25 + $0.40 + $0.15 = $0.80 1,500 × ($2.00 - $0.80) = $1,800 increase
Diff: 3
Terms: one-time-only special order
Objective: 2
AACSB: Analytical skills
29) Snapper Tool Company has a production capacity of 3,000 units per month, but current production is only 2,500 units. Total manufacturing costs are $60 per unit and marketing costs are $16 per unit. Doug Levy offers to purchase 500 units at $76 each for the next five months. Should Snapper accept the one-time-only special order if only absorption-costing data are available?
A) Yes, good customer relations are essential.
B) No, the company will only break even.
C) No, since only the employees will benefit.
D) Yes, since operating profits will most likely increase.
Answer: D
Explanation: D) Since the $60 absorption cost per unit is most likely not all variable costs and since the entire $16 per unit of marketing costs may not be incurred, operating profits will most likely increase.
Diff: 3
Terms: one-time-only special order
Objective: 2
AACSB: Analytical skills

Answer the following questions using the information below:

Heck's Kitchens is approached by Mr. Louis Cifer, a new customer, to fulfill a large one-time-only special order for a product similar to one offered to regular customers. The following per unit data apply for sales to regular customers:

- Direct materials $455
- Direct labor 300
- Variable manufacturing support 45
- Fixed manufacturing support 100
- Total manufacturing costs 900
- Markup (60%) 540
- Targeted selling price $1,440

Heck's Kitchens has excess capacity. Mr. Cifer wants the cabinets in cherry rather than oak, so direct material costs will increase by $50 per unit.

30) For Heck's Kitchens, what is the minimum acceptable price of this one-time-only special order?
A) $850
B) $950
C) $805
D) $1,460
Answer: A
Explanation: A) $455 + $300 + $45 + $50 = $850
Diff: 2
Terms: one-time-only special order
Objective: 2
AACSB: Analytical skills
31) Other than price, what other items should Heck's Kitchens consider before accepting this one-time-only special order?
A) reaction of shareholders
B) reaction of existing customers to the lower price offered to Mr. Louis Cifer
C) demand for cherry cabinets
D) price is the only consideration
Answer: B
Diff: 2
Terms: one-time-only special order, qualitative factors
Objective: 2
AACSB: Analytical skills

32) If Louis Cifer wanted a long-term commitment for supplying this product, this analysis:
A) would definitely be different
B) may be different
C) would not be different
D) does not contain enough information to determine if there would be a difference
Answer: A
Diff: 2
Terms: one-time-only special order
Objective: 2
AACSB: Analytical skills

33) An example of a quantitative factor for the decision-making process is:
A) customer satisfaction
B) employee morale
C) product quality
D) manufacturing overhead
Answer: D
Diff: 1
Terms: quantitative factors
Objective: 2
AACSB: Reflective thinking
Black Forrest manufactures rustic furniture. The cost accounting system estimates manufacturing costs to be $180 per table, consisting of 80% variable costs and 20% fixed costs. The company has surplus capacity available. It is Back Forrest's policy to add a 50% markup to full costs.

34) Black Forrest is invited to bid on a one-time-only special order to supply 100 rustic tables. What is the lowest price Black Forrest should bid on this special order?
A) $12,600
B) $14,400
C) $18,000
D) $23,000
Answer: B
Explanation: B) $180 × 80% × 100 tables = $14,400
Diff: 2
Terms: one-time-only special order
Objective: 2
AACSB: Analytical skills

35) A large hotel chain is currently expanding and has decided to decorate all new hotels using the rustic style. Black Forrest Incorporated is invited to submit a bid to the hotel chain. What is the lowest price per unit Black Forrest should bid on this long-term order?
A) $126
B) $144
C) $180
D) $270
Answer: D
Explanation: D) $180 + ($180 × 50%) = $270
Diff: 2
Terms: one-time-only special order
Objective: 2
AACSB: Analytical skills
36) Zephram Corporation has a plant capacity of 200,000 units per month. Unit costs at capacity are:

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$4.00</td>
</tr>
<tr>
<td>Direct labor</td>
<td>6.00</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>3.00</td>
</tr>
<tr>
<td>Fixed overhead</td>
<td>1.00</td>
</tr>
<tr>
<td>Marketing fixed</td>
<td>7.00</td>
</tr>
<tr>
<td>Marketing/distribution variable</td>
<td>3.60</td>
</tr>
</tbody>
</table>

Current monthly sales are 190,000 units at $30.00 each. Q, Inc., has contacted Zephram Corporation about purchasing 2,000 units at $24.00 each. Current sales would not be affected by the one-time-only special order. What is Zephram's change in operating profits if the one-time-only special order is accepted?

A) $14,800 increase  
B) $17,200 increase  
C) $22,000 increase  
D) $33,200 increase

Answer: A
Explanation:  
A) ($4.00 + $6.00 + $3.00 + $3.60) = $16.60  
($24.00 - $16.60) × 2,000 = $14,800 increase

Diff: 3  
Terms: one-time-only special order  
Objective: 2  
AACSB: Analytical skills

37) The sum of all the costs incurred in a particular business function (for example, marketing) is called the:

A) business function cost  
B) full product cost  
C) gross product cost  
D) multiproduct cost

Answer: A
Diff: 1  
Terms: business function costs  
Objective: 2  
AACSB: Reflective thinking

38) The sum of all costs incurred in all business functions in the value chain (product design, manufacturing, marketing, and customer service, for example) is known as the:

A) business cost  
B) full product cost  
C) gross product cost  
D) multiproduct cost

Answer: B
Diff: 1  
Terms: full costs of the product  
Objective: 2  
AACSB: Reflective thinking
39) An example of a qualitative factor for the decision-making process is:
A) customer satisfaction
B) units sold
C) material cost
D) labor hours incurred
Answer: A
Diff: 2
Terms: qualitative factors
Objective: 2
AACSB: Ethical reasoning

40) Outsourcing is:
A) purchasing goods and services internally
B) never a viable option
C) more desirable than insourcing
D) purchasing goods and services from outside vendors
Answer: D
Diff: 2
Terms: outsourcing
Objective: 2
AACSB: Reflective thinking

41) Insourcing is:
A) purchasing goods and services internally
B) purchasing goods and services from outside vendors
C) more expensive than outsourcing
D) less expensive than outsourcing
Answer: A
Diff: 2
Terms: insourcing
Objective: 2
AACSB: Reflective thinking

42) Problems that should be avoided when identifying relevant costs include all of the following EXCEPT:
A) assuming all variable costs are relevant
B) assuming all fixed costs are irrelevant
C) using unit costs that do not separate variable and fixed components
D) using total costs that separate variable and fixed components
Answer: D
Diff: 2
Terms: relevant costs
Objective: 2
AACSB: Reflective thinking
43) The best way to avoid misidentification of relevant costs is to focus on:
A) expected future costs that differ among the alternatives
B) historical costs
C) unit fixed costs
D) total unit costs
Answer: A
Diff: 2
Terms: relevant costs
Objective: 2
AACSB: Reflective thinking

44) Factors used to decide whether to outsource a part include:
A) the supplier's cost of direct materials
B) if the supplier is reliable
C) the original cost of equipment currently used for production of that part
D) past design costs used to develop the current composition of the part
Answer: B
Diff: 2
Terms: outsourcing, make-or-buy decision
Objective: 2
AACSB: Reflective thinking

45) Relevant costs of a make-or-buy decision include all of the following EXCEPT:
A) fixed salaries that will not be incurred if the part is outsourced
B) current direct material costs of the part
C) special machinery for the part that has no resale value
D) material-handling costs that can be eliminated
Answer: C
Diff: 3
Terms: relevant costs, outsourcing, make-or-buy decision
Objective: 2
AACSB: Reflective thinking

46) Which of following are risks of outsourcing the production of a part?
A) unpredictable quality
B) unreliable delivery
C) unscheduled price increases
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: outsourcing, make-or-buy decision
Objective: 2
AACSB: Reflective thinking
47) Which of the following minimize the risks of outsourcing?
A) the use of short-term contracts that specify price
B) the responsibility for on-time delivery is now the responsibility of the supplier
C) building close relationships with the supplier
D) All of these answers are correct.
Answer: C

48) The cost to produce Part A was $20 per unit in 2013 and in 2014 it has increased to $22 per unit. In 2014, Supplier ABC has offered to supply Part A for $18 per unit. For the make-or-buy decision:
A) incremental revenues are $4 per unit
B) incremental costs are $2 per unit
C) net relevant costs are $2 per unit
D) differential costs are $4 per unit
Answer: D

49) When evaluating a make-or-buy decision, which of the following does NOT need to be considered?
A) alternative uses of the production capacity
B) the original cost of the production equipment
C) the quality of the supplier's product
D) the reliability of the supplier's delivery schedule
Answer: B

50) For make-or-buy decisions, a supplier's ability to deliver the item on a timely basis is considered a(n):
A) qualitative factor
B) relevant cost
C) differential factor
D) opportunity cost
Answer: A
51) The incremental costs of producing one more unit of product include all of the following EXCEPT:
A) direct materials
B) direct labor
C) variable overhead costs
D) fixed overhead costs
Answer: D
Diff: 2
Terms: incremental cost
Objective: 2
AACSB: Reflective thinking

52) Direct materials are $20, direct labor is $5, variable overhead costs are $15, and fixed overhead costs are $10. In the short term, the incremental cost of one unit is:
A) $15
B) $25
C) $40
D) $50
Answer: C
Diff: 2
Terms: incremental cost
Objective: 2
AACSB: Analytical skills

53) Unit cost data can most mislead decisions by:
A) not computing fixed overhead costs
B) computing labor and materials costs only
C) computing administrative costs
D) not computing unit costs at the same output level
Answer: D
Diff: 1
Terms: full costs of the product
Objective: 2
AACSB: Reflective thinking

54) Schmidt Sewing Company incorporates the services of Deb's Sewing. Schmidt purchases pre-cut dresses from Deb's. This is primarily known as:
A) insourcing
B) outsourcing
C) relevant costing
D) sunk costing
Answer: B
Diff: 1
Terms: outsourcing
Objective: 2
AACSB: Reflective thinking
55) Smiley Face Company manufactures signs from direct materials to the finished product. This is considered:
A) insourcing  
B) outsourcing  
C) relevant costing  
D) sunk costing  
Answer: A  
Diff: 1  
Terms: insourcing  
Objective: 2  
AACSB: Reflective thinking

56) Which of the following would NOT be considered in a make-or-buy decision?  
A) fixed costs that will no longer be incurred  
B) variable costs of production  
C) potential rental income from space occupied by the production area  
D) unchanged supervisory costs  
Answer: D  
Diff: 2  
Terms: make-or-buy decision  
Objective: 2  
AACSB: Reflective thinking

Answer the following questions using the information below:

Donald's Engine Company manufactures part TE456 used in several of its engine models. Monthly production costs for 1,000 units are as follows:

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$20,000</td>
</tr>
<tr>
<td>Direct labor</td>
<td>5,000</td>
</tr>
<tr>
<td>Variable overhead costs</td>
<td>15,000</td>
</tr>
<tr>
<td>Fixed overhead costs</td>
<td>10,000</td>
</tr>
<tr>
<td>Total costs</td>
<td>$50,000</td>
</tr>
</tbody>
</table>

It is estimated that 10% of the fixed overhead costs assigned to TE456 will no longer be incurred if the company purchases TE456 from the outside supplier. Donald's Engine Company has the option of purchasing the part from an outside supplier at $42.50 per unit.

57) If Donald's Engine Company accepts the offer from the outside supplier, the monthly avoidable costs (costs that will no longer be incurred) total:
A) $41,000  
B) $49,000  
C) $25,000  
D) $50,000  
Answer: A  
Explanation: A) $20,000 + $5,000 + $15,000 + ($10,000 × 10%) = $41,000  
Diff: 2  
Terms: make-or-buy decision, outsourcing  
Objective: 2  
AACSB: Analytical skills
58) If Donald's Engine Company purchases 1,000 TE456 parts from the outside supplier per month, then its monthly operating income will:
A) increase by $1,000
B) increase by $40,000
C) decrease by $1,500
D) decrease by $42,500
Answer: C
Explanation: C) Avoidable costs $41,000 - ($42.50 × 1,000 units) = decrease of $1,500
Diff: 2
Terms: make-or-buy decision, outsourcing
Objective: 2
AACSB: Analytical skills

59) The maximum price that Donald's Engine Company should be willing to pay the outside supplier is:
A) $40 per TE456 part
B) $41 per TE456 part
C) $49 per TE456 part
D) $50 per TE456 part
Answer: B
Explanation: B) Avoidable costs $41,000 / 1,000 units = $41 per part
Diff: 2
Terms: make-or-buy decision, outsourcing
Objective: 2
AACSB: Analytical skills
Answer the following questions using the information below:

Piels Corporation produces a part that is used in the manufacture of one of its products. The costs associated with the production of 10,000 units of this part are as follows:

<table>
<thead>
<tr>
<th>Costs</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$90,000</td>
</tr>
<tr>
<td>Direct labor</td>
<td>$130,000</td>
</tr>
<tr>
<td>Variable factory overhead</td>
<td>$60,000</td>
</tr>
<tr>
<td>Fixed factory overhead</td>
<td>$140,000</td>
</tr>
<tr>
<td>Total costs</td>
<td>$420,000</td>
</tr>
</tbody>
</table>

Of the fixed factory overhead costs, $60,000 is avoidable.

60) Conners Company has offered to sell 10,000 units of the same part to Piels Corporation for $36 per unit. Assuming there is no other use for the facilities, Schmidt should:
A) make the part, as this would save $6 per unit
B) buy the part, as this would save $6 per unit
C) buy the part, as this would save the company $60,000
D) make the part, as this would save $2 per unit
Answer: D  
Explanation: D) Avoidable costs total $340,000 = $90,000 + $130,000 + $60,000 + $60,000.  
$36 - ($340,000/10,000) = $2

61) Assuming no other use of their facilities, the highest price that Piels should be willing to pay for 10,000 units of the part is:
A) $420,000  
B) $280,000  
C) $340,000  
D) $360,000  
Answer: C  
Explanation: C) $90,000 + $130,000 + $60,000 + $60,000 + $60,000 = $340,000

62) Relevant costs are expected future costs that differ among alternatives.
Answer: TRUE

Terms: make-or-buy decision, outsourcing  
Objective: 2  
AACSB: Analytical skills

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63) Relevant revenues are expected future revenues that do NOT differ among alternatives.
Answer: FALSE
Explanation: Relevant revenues are expected future revenues that differ among alternatives.
Diff: 2
Terms: relevant revenues
Objective: 2
AACSB: Reflective thinking

64) The amount paid to purchase equipment last year is an example of a sunk cost.
Answer: TRUE
Diff: 2
Terms: sunk costs
Objective: 2
AACSB: Analytical skills

65) For decision making, differential costs assist in choosing between alternatives.
Answer: TRUE
Diff: 1
Terms: differential cost
Objective: 2
AACSB: Reflective thinking

66) For a particular decision, differential revenues and differential costs are always relevant.
Answer: TRUE
Diff: 1
Terms: differential cost, differential revenue
Objective: 2
AACSB: Reflective thinking

67) A cost may be relevant for one decision, but NOT relevant for a different decision.
Answer: TRUE
Diff: 2
Terms: relevant costs
Objective: 2
AACSB: Reflective thinking

68) Revenues that remain the same for two alternatives being examined are relevant revenues.
Answer: FALSE
Explanation: Revenues that remain the same between two alternatives are irrelevant for that decision since they do not differ between alternatives.
Diff: 1
Terms: relevant revenues
Objective: 2
AACSB: Reflective thinking
69) Sunk costs are past costs that are unavoidable.
Answer: TRUE
Diff: 1
Terms: sunk costs
Objective: 2
AACSB: Reflective thinking

70) The cost of a machine purchased last year will be irrelevant in a decision for next year.
Answer: TRUE
Diff: 2
Terms: sunk costs, relevant costs
Objective: 2
AACSB: Analytical skills

71) A sunk cost can never be relevant.
Answer: TRUE
Diff: 2
Terms: sunk costs, relevant costs
Objective: 2
AACSB: Reflective thinking

72) Quantitative factors are outcomes that are measured in numerical terms.
Answer: TRUE
Diff: 2
Terms: quantitative factors
Objective: 2
AACSB: Reflective thinking

73) Qualitative factors are outcomes that are measured in numerical terms, such as the costs of direct labor.
Answer: FALSE
Explanation: Qualitative factors are outcomes that are difficult to measure accurately in numerical terms. Employee morale is an example.
Diff: 1
Terms: qualitative factors
Objective: 2
AACSB: Reflective thinking

74) If a manufacturer chooses to continue purchasing direct materials from a supplier because of the ongoing relationship that has developed over the years, the decision is based partially on qualitative factors.
Answer: TRUE
Diff: 2
Terms: qualitative factors
Objective: 2
AACSB: Reflective thinking
75) Relevant revenues and relevant costs are the only information managers need to select among alternatives.
   Answer: FALSE
   Explanation: Qualitative factors, as well as relevant revenues and relevant costs need to be considered when selecting among alternatives.
   Diff: 3
   Terms: relevant revenues, relevant costs, qualitative factors
   Objective: 2
   AACSB: Reflective thinking

76) Full costs of a product are relevant for one-time-only special order pricing decisions.
   Answer: FALSE
   Explanation: Incremental costs of a product are relevant for one-time-only special order pricing decisions.
   Diff: 2
   Terms: full costs of the product, one-time-only special order, relevant costs
   Objective: 2
   AACSB: Reflective thinking

77) Full costs of a product include variable costs, but not fixed costs.
   Answer: FALSE
   Explanation: Full costs of a product include variable and fixed costs for all business functions in the value chain.
   Diff: 1
   Terms: full costs of the product
   Objective: 2
   AACSB: Reflective thinking

78) For one-time-only special orders, fixed costs may be relevant but NOT variable costs.
   Answer: FALSE
   Explanation: For one-time-only special orders, variable costs may be relevant but not fixed costs.
   Diff: 2
   Terms: one-time-only special order, relevant costs
   Objective: 2
   AACSB: Reflective thinking

79) The price quoted for a one-time-only special order may be LESS than the price for a long-term customer.
   Answer: TRUE
   Diff: 2
   Terms: one-time-only special order
   Objective: 2
   AACSB: Reflective thinking
80) Bid prices and costs that are relevant for regular orders are the same costs that are relevant for one-time-only special orders.
Answer: FALSE
Explanation: Since long-term costs are relevant for regular orders and short-term costs are relevant for one-time-only special orders, the relevant costs differ.
Diff: 2
Terms: one-time-only special order, relevant costs
Objective: 2
AACSB: Reflective thinking

81) Qualitative factors, because they are NOT measured numerically, are unimportant in the decision-making process.
Answer: FALSE
Explanation: Qualitative factors are important in the decision-making process even though they cannot be measured numerically.
Diff: 2
Terms: qualitative factors
Objective: 2
AACSB: Reflective thinking

82) In a one-time special order situation, if the price offered by the buyer is less than the absorption cost per unit, the special order may still be profitable since absorption costs include allocated fixed manufacturing overhead.
Answer: TRUE
Diff: 3
Terms: one-time-only special order, full costs of the product
Objective: 2
AACSB: Reflective thinking

83) In relevant cost analysis, managers should avoid incorrect general assumptions and beware of misleading unit cost information.
Answer: TRUE
Diff: 3
Terms: relevant costs
Objective: 2
AACSB: Ethical reasoning

84) An incremental product cost is generally a fixed cost.
Answer: FALSE
Explanation: An incremental product cost is generally a variable cost.
Diff: 1
Terms: incremental cost
Objective: 2
AACSB: Reflective thinking
85) If Option 1 costs $120 and Option 2 costs $90, then the differential cost is $210.
Answer: FALSE
Explanation: If Option 1 costs $120 and Option 2 costs $90, then the differential cost is $30.
Diff: 1
Terms: differential cost
Objective: 2
AACSB: Analytical skills

86) If additional capacity is added to produce another 10,000 units, this may increase the fixed cost of rent.
Answer: TRUE
Diff: 3
Terms: incremental cost
Objective: 2
AACSB: Analytical skills

87) Variable cost per unit is the best product cost to use for one-time-only special order decisions.
Answer: TRUE
Diff: 2
Terms: full costs of the product, one-time-only special order
Objective: 2
AACSB: Reflective thinking

88) Sometimes qualitative factors are the most important factors in make-or-buy decisions.
Answer: TRUE
Diff: 2
Terms: qualitative factors
Objective: 2
AACSB: Reflective thinking

89) If a company is deciding whether to outsource a part, the reliability of the supplier is an important factor to consider.
Answer: TRUE
Diff: 2
Terms: outsourcing, make-or-buy decision
Objective: 2
AACSB: Analytical skills

90) Outsourcing is risk free to the manufacturer because the supplier now has the responsibility of producing the part.
Answer: FALSE
Explanation: Outsourcing has risks since the manufacturer is dependent on the supplier for a quality product, delivered in a timely manner, for a reasonable price.
Diff: 2
Terms: outsourcing, make-or-buy decision
Objective: 2
AACSB: Reflective thinking
Fluty Corporation manufactures a product that has two parts, A and B. It is currently considering two alternative proposals related to these parts.

The first proposal is for buying Part A. This would free up some of the plant space for the manufacture of more of Part B and assembly of the final product. The product vice president believes the additional production of the final product can be sold at the current market price. No other changes in manufacturing would be needed.

The second proposal is for buying new equipment for the production of Part B. The new equipment requires fewer workers and uses less power to operate. The old equipment has a net disposal value of zero.

**Required:**
Tell whether the following items are relevant or irrelevant for each proposal. Treat each proposal independently.

1. Total variable manufacturing overhead, Part A
2. Total variable manufacturing overhead, Part B
3. Cost of old equipment for manufacturing Part B
4. Cost of new equipment for manufacturing Part B
5. Total variable selling and administrative costs
6. Sales revenue of the product
7. Total variable costs of assembling final products
8. Total direct manufacturing materials, Part A
9. Total direct manufacturing materials, Part B
10. Total direct manufacturing labor, Part A
11. Total direct manufacturing labor, Part B

**Answer:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Proposal 1</th>
<th>Proposal 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>R</td>
<td>I</td>
</tr>
<tr>
<td>b.</td>
<td>R</td>
<td>R</td>
</tr>
<tr>
<td>c.</td>
<td>I</td>
<td>I</td>
</tr>
<tr>
<td>d.</td>
<td>I</td>
<td>R</td>
</tr>
<tr>
<td>e.</td>
<td>R</td>
<td>I</td>
</tr>
<tr>
<td>f.</td>
<td>R</td>
<td>I</td>
</tr>
<tr>
<td>g.</td>
<td>R</td>
<td>I</td>
</tr>
<tr>
<td>h.</td>
<td>R</td>
<td>I</td>
</tr>
<tr>
<td>i.</td>
<td>R</td>
<td>I</td>
</tr>
<tr>
<td>j.</td>
<td>R</td>
<td>I</td>
</tr>
<tr>
<td>k.</td>
<td>R</td>
<td>R</td>
</tr>
</tbody>
</table>

**Diff:** 2

**Terms:** relevant revenues, relevant costs

**Objective:** 2

**AACSB:** Analytical skills
92) Parker and Spitzer Manufacturing is approached by a European customer to fulfill a one-time-only special order for a product similar to one offered to domestic customers. The following per unit data apply for sales to regular customers:

<table>
<thead>
<tr>
<th>Direct materials</th>
<th>$66</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct labor</td>
<td>30</td>
</tr>
<tr>
<td>Variable manufacturing support</td>
<td>48</td>
</tr>
<tr>
<td>Fixed manufacturing support</td>
<td>104</td>
</tr>
<tr>
<td>Total manufacturing costs</td>
<td>248</td>
</tr>
<tr>
<td>Markup (50%)</td>
<td>124</td>
</tr>
<tr>
<td>Targeted selling price</td>
<td>$372</td>
</tr>
</tbody>
</table>

Parker and Spitzer Manufacturing has excess capacity.

**Required:**

a. What is the full cost of the product per unit?

b. What is the contribution margin per unit?

c. Which costs are relevant for making the decision regarding this one-time-only special order? Why?

d. For Parker and Spitzer Manufacturing, what is the minimum acceptable price of this one-time-only special order?

e. For this one-time-only special order, should Parker and Spitzer Manufacturing consider a price of $200 per unit? Why or why not?

**Answer:**

a. $248

b. $228 = Selling price $372 - Variable costs ($66 + $30 + $48).

c. Relevant costs for decision making are those costs that differ between alternatives, which in this situation are the incremental costs. The incremental costs total $144 = Variable costs ($66 + $30 + $48).

d. The minimum acceptable price is $144 = Variable costs ($66 + $30 + $48), which are the incremental costs in the short term.

e. Yes, because this price is greater than the minimum acceptable price of this special order determined in (d).

**Diff:** 2

**Terms:** one-time-only special order, relevant revenues, relevant costs

**Objective:** 2

**AACSB:** Analytical skills
Loft Lake Cabinets is approached by Ms. Jenny Zhang, a new customer, to fulfill a large one-time-only special order for a product similar to one offered to regular customers. The following per unit data apply for sales to regular customers:

- Direct materials $50.00
- Direct labor 62.50
- Variable manufacturing support 30.00
- Fixed manufacturing support 37.50
- Total manufacturing costs 180.00
- Markup (60%) 108.00
- Targeted selling price $288.00

Loft Lake Cabinets has excess capacity. Ms. Zhang wants the cabinets in cherry rather than oak, so direct material costs will increase by $15 per unit.

**Required:**

a. For Loft Lake Cabinets, what is the minimum acceptable price of this one-time-only special order?

b. Other than price, what other items should Loft Lake Cabinets consider before accepting this one-time-only special order?

c. How would the analysis differ if there was limited capacity?

**Answer:**

a. $157.70 = Variable costs ($50 + $62.50 + $30) + $15 additional cost for cherry.

b. Loft Lake Cabinets should also consider the impact on current customers when these customers hear that another customer was offered a discounted price, and the impact on the competition and if they might choose to meet the discounted price.

c. Currently, the incremental costs total $157.50. If additional capacity is needed to process this order, these incremental costs will increase by the cost of adding capacity.

Diff: 3

Terms: one-time-only special order, relevant costs

Objective: 2

AACSB: Analytical skills
94) Quiett Truck manufactures part WB23 used in several of its truck models. 10,000 units are produced each year with production costs as follows:

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$45,000</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>15,000</td>
</tr>
<tr>
<td>Variable support costs</td>
<td>35,000</td>
</tr>
<tr>
<td>Fixed support costs</td>
<td>25,000</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td><strong>$120,000</strong></td>
</tr>
</tbody>
</table>

Quiett Truck has the option of purchasing part WB23 from an outside supplier at $11.20 per unit. If WB23 is outsourced, 40% of the fixed costs cannot be immediately converted to other uses.

a. Describe avoidable costs. What amount of the WB23 production costs is avoidable?
b. Should Quiett Truck outsource WB23? Why or why not?
c. What other items should Quiett Truck consider before outsourcing any of the parts it currently manufactures?

Answer:

a. Avoidable costs are those costs eliminated when a part, product, product line, or business segmented is discontinued. Avoidable production costs for WB23 total $110,000, which are all but the $10,000 ($25,000 × 40%) of fixed costs that cannot be immediately converted to other uses.

b. Based on the financial considerations given, Quiett Truck should NOT outsource WB23 because the $112,000 (10,000 units × $11.20 per part) outsourced cost is greater than the $110,000 reduction in annual production costs. In other words, the outsourcing would cost Quiett Truck an additional $2,000 annually.

c. Other factors to consider include the supplier's ability to meet expected quality and delivery standards, and the likelihood of suppliers increasing prices of components in the future.

Diff: 2
Terms: relevant costs
Objective: 2
AACSB: Analytical skills
95) Southwestern Company needs 1,000 motors in its manufacture of automobiles. It can buy the motors from Jinx Motors for $1,250 each. Southwestern's plant can manufacture the motors for the following costs per unit:

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$ 500</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>250</td>
</tr>
<tr>
<td>Variable manufacturing overhead</td>
<td>200</td>
</tr>
<tr>
<td>Fixed manufacturing overhead</td>
<td>350</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1,300</strong></td>
</tr>
</tbody>
</table>

If Southwestern buys the motors from Jinx, 70% of the fixed manufacturing overhead applied will not be avoided.

**Required:**

a. Should the company make or buy the motors?
b. What additional factors should Southwestern consider in deciding whether or NOT to make or buy the motors?

**Answer:**

a. **Cost to buy the part:**

\[
(1,000 \times $1,250) \quad $1,250,000
\]

**Relevant costs to make:**

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable costs:</td>
<td></td>
</tr>
<tr>
<td>Direct materials (1,000 \times $500)</td>
<td>$500,000</td>
</tr>
<tr>
<td>Direct manufacturing labor (1,000 \times $250)</td>
<td>250,000</td>
</tr>
<tr>
<td>Variable manufacturing overhead (1,000 \times $200)</td>
<td>200,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>950,000</strong></td>
</tr>
</tbody>
</table>

**Avoidable fixed costs:**

\[
($350 \times 1,000 \times 0.30) \quad 105,000 \quad 1,055,000
\]

**Savings if part is manufactured:**

\[
$195,000
\]

b. Management should consider several qualitative factors in deciding whether to make or buy the motors.

- **Quality controls** - The company's ability to manufacture quality motors versus that of the supplier.
- **Delivery** - Can they make them when needed versus Jinx delivering them when needed?
- **Reputation** - What is the overall reputation of Jinx?
- **Term** - Is Jinx willing to make long-term commitments for delivery of the motors?
- **Facilities** - What are the opportunity costs of using the space and equipment to manufacture other items?

**Diff:** 2

Terms: relevant costs, qualitative factors

Objective: 2

AACSB: Analytical skills
96) Sarasota Bicycles has been manufacturing its own wheels for its bikes. The company is currently operating at 100% capacity, and variable manufacturing overhead is charged to production at the rate of 30% of direct labor cost. The direct materials and direct labor cost per unit to make the wheels are $3.00 and $3.60 respectively. Normal production is 200,000 wheels per year.

A supplier offers to make the wheels at a price of $8 each. If the bicycle company accepts this offer, all variable manufacturing costs will be eliminated, but the $84,000 of fixed manufacturing overhead currently being charged to the wheels will have to be absorbed by other products.

**Required:**

a. Prepare an incremental analysis for the decision to make or buy the wheels.
b. Should Sarasota Bicycles buy the wheels from the outside supplier? Justify your answer.

**Answer:**

a. Make | Buy
--- | ---
Direct materials (200,000 × $3.00) | $600,000 | -0-
Direct labor (200,000 × $3.60) | 720,000 | -0-
Variable manufacturing costs | 216,000 | -0-
($720,000 × 30%) | -0- | 1,600,000
Purchase price (200,000 × $8) | -0- | 1,600,000
Total annual cost | $1,536,000 | $1,600,000

b. The wheels should continue to be manufactured by Sarasota Bicycles. The company's net income would decrease $64,000 by purchasing the wheels.

**Diff:** 2

**Terms:** make-or-buy decision

**Objective:** 2

**AACSB:** Analytical skills

97) Explain what revenues and costs are relevant when choosing among alternatives.

**Answer:** Future amounts that differ among alternatives are considered relevant. Amounts that remain the same among alternatives do not add useful information for selecting an alternative, and therefore, are not considered relevant for decision making.

**Diff:** 2

**Terms:** relevant costs, relevant revenues

**Objective:** 2

**AACSB:** Reflective thinking

98) Explain why sunk costs are not considered relevant when choosing among alternatives.

**Answer:** Amounts that remain the same among alternatives do not add useful information for selecting an alternative, and therefore, are not considered relevant for decision making. Sunk costs by definition are those costs that have already been committed, cannot be changed, and will never differ among alternatives.

**Diff:** 2

**Terms:** sunk costs, relevant costs

**Objective:** 2

**AACSB:** Reflective thinking
99) Assume you are a sophomore in college and are committed to earning an undergraduate degree. Your current decision is whether to finish college in four consecutive years or take a year off and work for some extra cash.

a. Identify at least two revenues or costs that are relevant to making this decision. Explain why each is relevant.
b. Identify at least two costs that would be considered sunk costs for this decision.
c. Comment on at least one qualitative consideration for this decision.

Answer:

a. Relevant revenues/costs are those that differ between the alternatives of continuing with college or taking a year off from college and working. Relevant costs for continuing your college education without a break include:
   1. Earnings lost next year due to the hours you are not able to work because of classes and homework.
   2. As a result of graduating a year earlier, higher wages will be earned a year earlier as well.

b. Sunk costs for this decision include:
   1. Amounts paid for college tuition and books during the past two years.
   2. Amounts committed for college tuition and books for the remaining two years.

c. A qualitative consideration would include having different activities and priorities than your friends who are students, graduating later than students who started college the same time you did, and retaining information over the year off from school.

Diff: 2
Terms: relevant costs, opportunity cost, qualitative factors
Objective: 2
AACSB: Reflective thinking
100) A restaurant is deciding whether it wants to update its image or not. It currently has a cozy appeal with an outdated decor that is still in good condition, menus and carpet that need to be replaced anyway, and loyal customers.

Identify for the restaurant management
a. those costs that are relevant to this decision,
b. those costs that are not differential,
c. and qualitative considerations.
Answer: For the decision of whether to update the restaurant's image:
a. Relevant costs include a one-time cost of the renovation for the updated image, and a change in future sales which includes an increase in sales due to the updated image, decrease in sales due to loss of that cozy appeal, and loss of sales due to being closed or having a limited serving area during renovation.
b. Costs that are not differential include replacing the menus and the carpet since they need to be replaced whether the image is updated or not.
c. Qualitative considerations include whether the restaurant will lose that cozy appeal it currently has, if the restaurant needs to be closed for renovations it may result in loss of customers, and new customers may not be the type of customer they want to attract.

Diff: 2
Terms: relevant costs, qualitative factors, differential cost
Objective: 2
AACSB: Reflective thinking

101) Are relevant revenues and relevant costs the only information needed by managers to select among alternatives? Explain using examples.
Answer: No, relevant revenues and costs provide a financial analysis but do not take into consideration qualitative implications. In a make-or-buy decision, examples of qualitative issues include the supplier's ability to meet expected quality and delivery standards, and the likelihood that suppliers increase prices of the components in the future.

Diff: 2
Terms: relevant costs, relevant revenues
Objective: 2
AACSB: Reflective thinking

102) Under what conditions might a manufacturing firm sell a product for less than its long-term price? Why?
Answer: The price for a short-term order may be less than the price offered to a long-term customer. If a firm has excess capacity that is sitting idle, it is more profitable for the firm to accept a special order for a price below the long-run price than it is to let the capacity sit idle. In addition, the firm may use this strategy for market penetration and to obtain greater market share.

Diff: 2
Terms: one-time-only special order
Objective: 2
AACSB: Reflective thinking
Objective 11.3

1) If there was limited capacity, all of the following amounts would change EXCEPT:
   A) opportunity costs
   B) differential costs
   C) variable costs
   D) the minimum acceptable price
   Answer:  C
   Diff: 3
   Terms:  constraint
   Objective:  3
   AACSB:  Reflective thinking

2) Relevant costs in a make-or-buy decision of a part include:
   A) setup overhead for the manufacture of the product using the outsourced part
   B) currently used manufacturing capacity that has alternative uses
   C) annual plant insurance costs that will remain the same
   D) corporate office costs that will be allocated differently
   Answer:  B
   Diff: 3
   Terms:  make-or-buy decision, outsourcing, relevant costs
   Objective:  3
   AACSB:  Reflective thinking

3) If Wharton Corporation does NOT use one of its limited resources in the best possible way, the lost
   contribution to income could be called a(n):
   A) variable cost
   B) fixed cost
   C) opportunity cost
   D) sunk cost
   Answer:  C
   Diff: 1
   Terms:  opportunity cost
   Objective:  3
   AACSB:  Reflective thinking

4) When a firm has constrained capacity as opposed to surplus capacity, opportunity costs will be:
   A) lower
   B) the same
   C) greater
   D) variable
   Answer:  C
   Diff: 2
   Terms:  opportunity cost, constraint
   Objective:  3
   AACSB:  Reflective thinking
5) Opportunity costs:
A) result in a cash outlay
B) only are considered when selecting among alternatives
C) are recorded in the accounting records
D) should be maximized for the best decision
Answer: B
Diff: 2
Terms: opportunity cost
Objective: 3
AACSB: Reflective thinking

6) Opportunity cost(s):
A) of a resource with excess capacity is zero
B) should be maximized by organizations
C) are recorded as an expense in the accounting records
D) are most important to financial accountants
Answer: A
Diff: 2
Terms: opportunity cost
Objective: 3
AACSB: Reflective thinking

7) ________ would be a consideration in a make-or-buy decision.
A) Excess capacity
B) Rental income from unused facilities
C) Variable factory overhead
D) All of the above are correct.
Answer: D
Diff: 2
Terms: make-or-buy decision
Objective: 3
AACSB: Reflective thinking

8) If a company has excess capacity, the most it would pay for buying a product that it currently makes would be the:
A) total variable cost of producing the product
B) market value less the usual markup on the product
C) total cost of producing the product
D) market value of the product
Answer: A
Diff: 2
Terms: make-or-buy decision
Objective: 3
AACSB: Reflective thinking
9) For make-or-buy decisions, relevant costs include:
A) direct material costs plus direct labor costs
B) incremental costs plus opportunity costs
C) differential costs plus fixed costs
D) incremental costs plus differential costs
Answer: B
Diff: 3
Terms: make-or-buy decision, outsourcing, opportunity cost, incremental cost
Objective: 3
AACSB: Reflective thinking

10) The opportunity cost of holding significant inventory includes:
A) the interest forgone on an alternative investment
B) additional insurance costs
C) additional storage costs
D) All of these answers are correct.
Answer: A
Diff: 2
Terms: opportunity cost
Objective: 3
AACSB: Reflective thinking

Answer the following questions using the information below:

Stephans Corporation currently manufactures a subassembly for its main product. The costs per unit are as follows:

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$ 1.00</td>
</tr>
<tr>
<td>Direct labor</td>
<td>10.00</td>
</tr>
<tr>
<td>Variable overhead</td>
<td>5.00</td>
</tr>
<tr>
<td>Fixed overhead</td>
<td>8.00</td>
</tr>
<tr>
<td>Total</td>
<td>$24.00</td>
</tr>
</tbody>
</table>

Bill Company has contacted Stephans with an offer to sell them 5,000 of the subassemblies for $22.00 each. Stephans will eliminate $25,000 of fixed overhead if it accepts the proposal.

11) What are the relevant costs for Stephans?
A) $140,000
B) $125,000
C) $105,000
D) $80,000
Answer: C
Explanation: C) \[(\$1 + \$10 + \$5) \times 5,000 + \$25,000\] = $105,000
Diff: 2
Terms: make-or-buy decision, outsourcing
Objective: 3
AACSB: Analytical skills
12) Should Stephans make or buy the subassemblies? What is the difference between the two alternatives?
A) Buy; savings = $20,000  
B) Buy; savings = $50,000  
C) Make; savings = $60,000  
D) Make; savings = $5,000  
Answer: D  
Explanation:  
D) Cost to buy: 5,000 × $22 = $110,000  
Cost to make: $110,000 - [($1 + $10 + $5) × 5,000 + $25,000] = $5,000; make the subassemblies 
Diff: 3  
Terms: make-or-buy decision, outsourcing  
Objective: 3  
AACSB: Analytical skills

13) A recent college graduate has the choice of buying a new car for $40,000 or investing the money for four years with a 6% expected annual rate of return. If the graduate decides to purchase the car, the best estimate of the opportunity cost of that decision is:
A) $2,400  
B) $9,600  
C) $40,000  
D) zero since there is no opportunity cost for this decision 
Answer: B  
Explanation:  
B) $40,000 × 6% × 4 years = $9,600 cost of the opportunity not chosen. 
Diff: 2  
Terms: opportunity cost  
Objective: 3  
AACSB: Analytical skills

14) A supplier offers to make Part A for $35. Altec Company has relevant costs of $40 a unit to manufacture 1,000 units of Part A. If there is excess capacity, the opportunity cost of buying Part A from the supplier is:
A) 0  
B) $40,000  
C) $35,000  
D) indeterminable 
Answer: A  
Diff: 2  
Terms: make-or-buy decision, outsourcing, opportunity cost  
Objective: 3  
AACSB: Analytical skills
15) Altec Company has relevant costs of $40 per unit to manufacture 1,000 units of Part A. A current supplier offers to make Part A for $35 per unit. If capacity is constrained, the opportunity cost of buying Part A from the supplier is:
   A) 0
   B) $5,000
   C) $35,000
   D) indeterminable
Answer: D
Explanation: D) Information regarding alternative uses for the capacity would determine the opportunity cost.
Diff: 2
Terms: make-or-buy decision, outsourcing, opportunity cost
Objective: 3
AACSB: Analytical skills

16) Opportunity cost is the contribution to operating income that is forgone by NOT using a limited resource in its next-best alternative use.
Answer: TRUE
Diff: 2
Terms: opportunity cost
Objective: 3
AACSB: Reflective thinking

17) Decisions about whether a producer of goods or services will insource or outsource are also called make-or-buy decisions.
Answer: TRUE
Diff: 1
Terms: make-or-buy decision
Objective: 3

18) When a firm maximizes profits it will simultaneously minimize opportunity costs.
Answer: TRUE
Diff: 3
Terms: opportunity cost
Objective: 3
AACSB: Reflective thinking

19) In a make-or-buy decision when there are alternative uses for capacity, the opportunity cost of idle capacity is irrelevant.
Answer: FALSE
Explanation: In a make-or-buy decision when there are alternative uses for capacity, the opportunity cost of idle capacity is relevant.
Diff: 3
Terms: make-or-buy decision, outsourcing, opportunity cost
Objective: 3
AACSB: Reflective thinking
20) When opportunity costs exist, they are always relevant.
Answer: TRUE
Diff: 3
Terms: opportunity cost, relevant costs
Objective: 3
AACSB: Reflective thinking

21) When capacity is constrained, relevant costs equal incremental costs plus opportunity costs.
Answer: TRUE
Diff: 2
Terms: constraint, relevant costs, incremental cost, opportunity cost
Objective: 3
AACSB: Reflective thinking

22) If the $20,000 spent to purchase inventory could be invested and earn interest of $500, then the
opportunity cost of holding inventory is $20,000.
Answer: FALSE
Explanation: The opportunity cost of holding inventory is $500.
Diff: 2
Terms: opportunity cost
Objective: 3
AACSB: Analytical skills

23) The choice is NOT really whether to make or buy, but rather how to best use available production
capacity.
Answer: TRUE
Diff: 1
Terms: make-or-buy decision, constraint
Objective: 3
AACSB: Analytical skills

24) Opportunity costs never appear in a company's accounting records since they are foregone costs and
NOT actual costs.
Answer: TRUE
Diff: 2
Terms: opportunity cost
Objective: 3
AACSB: Reflective thinking

25) For short-term pricing decisions, what costs are relevant when there is available surplus capacity?
When there is no available surplus capacity?
Answer: For both situations the relevant costs are the future incremental costs. However, when there is
limited capacity the incremental costs will be greater because they will include the costs of adding
capacity or the opportunity costs of alternative manufacturing choices.
Diff: 2
Terms: one-time-only special order, incremental cost
Objective: 3
AACSB: Reflective thinking
Objective 11.4

1) Determining which products should be produced when the plant is operating at full capacity is referred to as:
   A) an outsourcing analysis
   B) production scheduling analysis
   C) a product-mix decision
   D) a short-run focus decision
   Answer: C
   Diff: 1
   Terms: product-mix decisions
   Objective: 4
   AACSB: Reflective thinking

2) Product mix decisions:
   A) have a long-run focus
   B) help determine how to maximize operating profits
   C) focus on selling price per unit
   D) All of these answers are correct.
   Answer: B
   Diff: 2
   Terms: product-mix decisions
   Objective: 4
   AACSB: Reflective thinking

3) Constraints may include:
   A) the availability of direct materials in manufacturing
   B) linear square feet of display space for a retailer
   C) direct labor in the service industry
   D) All of these answers are correct.
   Answer: D
   Diff: 1
   Terms: constraint
   Objective: 4
   AACSB: Reflective thinking

4) With a constraining resource, managers should choose the product with the:
   A) lowest contribution margin per unit of the constraining resource
   B) highest sales price
   C) highest contribution margin per unit of the constraining resource
   D) highest gross profit
   Answer: C
   Diff: 1
   Terms: constraint, product-mix decisions
   Objective: 4
   AACSB: Reflective thinking
5) For determining the best mix of products, the one with the LEAST amount of influence is:
A) the market price of the products
B) corporate office costs allocated to each product
C) the use of capacity resources
D) contribution margins
Answer: B
Diff: 3
Terms: constraint, product-mix decisions
Objective: 4
AACSB: Reflective thinking

6) In product-mix decisions:
A) always focus on maximizing total contribution margin
B) focus on the product with the greatest contribution margin per machine-hour
C) focus on the full costs of the product
D) never focus on the short-term, but include only long-term considerations
Answer: A
Diff: 3
Terms: product-mix decisions
Objective: 4
AACSB: Reflective thinking

Answer the following questions using the information below:

Braun's Brakes manufactures three different product lines, Model X, Model Y, and Model Z. Considerable market demand exists for all models. The following per unit data apply:

<table>
<thead>
<tr>
<th></th>
<th>Model X</th>
<th>Model Y</th>
<th>Model Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>$50</td>
<td>$60</td>
<td>$70</td>
</tr>
<tr>
<td>Direct materials</td>
<td>6</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Direct labor ($12 per hour)</td>
<td>12</td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td>Variable support costs ($4 per machine-hour)</td>
<td>4</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Fixed support costs</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

7) Which model has the greatest contribution margin per unit?
A) Model X
B) Model Y
C) Model Z
D) Models X and Y
Answer: B
Explanation: B) Model X $50 - $6 - $12 - $4 = $28
Model Y $60 - $6 - $12 - $8 = $34 highest
Model Z $70 v $6 - $24 - $8 = $32
Diff: 2
Terms: product-mix decisions
Objective: 4
AACSB: Analytical skills
8) Which model has the greatest contribution margin per machine-hour?
A) Model X  
B) Model Y  
C) Model Z  
D) Models Y and Z  
Answer: A
Explanation: A) Model X $50 - $6 - $12 - $4 = $28 highest
Model Y $60 - $6 - $12 - $8 = $34/2=$17
Model Z $70 - $6 - $24 - $8 = $32/2=$16
Diff: 2
Terms: product-mix decisions, constraint
Objective: 4
AACSB: Analytical skills

9) If there is excess capacity, which model is the most profitable to produce?
A) Model X  
B) Model Y  
C) Model Z  
D) Models X and Y  
Answer: B
Explanation: B) Model Y since it has the greatest contribution margin per unit
Model X $50 - $6 - $12 - $4 = $28
Model Y $60 - $6 - $12 - $8 = $34 highest
Model Z $70 - $6 - $24 - $8 = $32
Diff: 3
Terms: product-mix decisions
Objective: 4
AACSB: Analytical skills

10) If there is a machine breakdown, which model is the most profitable to produce?
A) Model X  
B) Model Y  
C) Model Z  
D) Models Y and Z  
Answer: A
Explanation: A) Model X since it has the greatest contribution margin per machine-hour
Model X $50 - $6 - $12 - $4 = $28 highest
Model Y $60 - $6 - $12 - $8 = $34/2=$17
Model Z $70 - $6 - $24 - $8 = $32 /2=$16
Diff: 3
Terms: product-mix decisions, constraint
Objective: 4
AACSB: Analytical skills
11) How can Lisa Braun encourage her salespeople to promote the more profitable model?
A) Put all sales persons on salary.
B) Provide higher sales commissions for higher priced items.
C) Provide higher sales commissions for items with the greatest contribution margin per constrained resource.
D) Both B and C are correct.
Answer: C
Diff: 2
Terms: product-mix decisions, constraint
Objective: 4
AACSB: Reflective thinking

Answer the following questions using the information below:

Helmer’s Rockers manufactures two models, Standard and Premium. Weekly demand is estimated to be 100 units of the Standard Model and 70 units of the Premium Model. The following per unit data apply:

<table>
<thead>
<tr>
<th></th>
<th>Standard</th>
<th>Premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contribution margin per unit</td>
<td>$18</td>
<td>$20</td>
</tr>
<tr>
<td>Number of machine-hours required</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

12) The contribution per machine-hour is:
A) $18 for Standard, $20 for Premium
B) $54 for Standard, $80 for Premium
C) $15 for Standard, $16 for Premium
D) $6 for Standard, $5 for Premium
Answer: D
Explanation: D) Standard $18 / 3 = $6; Premium $20 / 4 = $5
Diff: 2
Terms: product-mix decisions, constraint
Objective: 4
AACSB: Analytical skills

13) If there are 496 machine-hours available per week, how many rockers of each model should Jim Helmer produce to maximize profits?
A) 100 units of Standard and 49 units of Premium
B) 72 units of Standard and 70 units of Premium
C) 100 units of Standard and 70 units of Premium
D) 85 units of Standard and 60 units of Premium
Answer: A
Explanation: A) Standard (100 units × 3mh) + Premium (49 units × 4 mh) = 496 machine-hours of the constrained resource
Diff: 2
Terms: product-mix decisions, constraint
Objective: 4
AACSB: Analytical skills
14) If there are 600 machine-hours available per week, how many rockers of each model should Jim Helmer produce to maximize profits?
A) 100 units of Standard and 49 units of Premium
B) 72 units of Standard and 70 units of Premium
C) 100 units of Standard and 70 units of Premium
D) 85 units of Standard and 60 units of Premium
Answer:  C
Explanation:  C) Standard (100 units × 3mh) + Premium (70 units × 4 mh) = 580 machine-hours for the current demand
Diff: 2
Terms:  product-mix decisions, constraint
Objective:  4
AACSB:  Analytical skills

Answer the following questions using the information below:

Lugozi Company manufactures three sizes of kitchen appliances: small, medium, and large. Product information is provided below.

<table>
<thead>
<tr>
<th></th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit selling price</td>
<td>$300</td>
<td>$500</td>
<td>$1,000</td>
</tr>
<tr>
<td>Unit costs:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Variable manufacturing</td>
<td>(120)</td>
<td>(240)</td>
<td>(400)</td>
</tr>
<tr>
<td>Fixed manufacturing</td>
<td>(80)</td>
<td>(100)</td>
<td>(240)</td>
</tr>
<tr>
<td>Variable selling and administrative</td>
<td>(60)</td>
<td>(60)</td>
<td>(60)</td>
</tr>
<tr>
<td>Unit profit</td>
<td>$ 40</td>
<td>$ 100</td>
<td>$300</td>
</tr>
<tr>
<td>Demand in units</td>
<td>100</td>
<td>120</td>
<td>100</td>
</tr>
<tr>
<td>Machine-hours per unit</td>
<td>20</td>
<td>40</td>
<td>100</td>
</tr>
</tbody>
</table>

The maximum machine-hours available are 6,000 per week.

15) What is the contribution margin per machine-hour for a large chair?
A) $2.50
B) $6.00
C) $5.40
D) $3.60
Answer:  C
Explanation:  C) $1,000 - $400 - $60 = $540
$540 / 100 = $5.40
Diff: 2
Terms:  product-mix decisions, constraint
Objective:  4
AACSB:  Analytical skills
16) Which of the three product models should be produced first if management incorporates a short-run profit maximizing strategy?
   A) small chairs
   B) medium chairs
   C) large chairs
   D) either medium or large chairs
   Answer: A
   Explanation:
   A) Small ($300 - $120 - $60) = $120 / 20 = $6.00 highest
   Medium ($500 - $240 - $60) = $200 / 40 = $5.00
   Large ($1,000 - $400 - $60) = $540 / 100 = $5.40
   Diff: 2
   Terms: product-mix decisions, constraint
   Objective: 4
   AACSB: Analytical skills

17) How many of each product should be produced per month using the short-run profit maximizing strategy?

<table>
<thead>
<tr>
<th></th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>A)</td>
<td>0</td>
<td>120</td>
<td>12</td>
</tr>
<tr>
<td>B)</td>
<td>100</td>
<td>0</td>
<td>40</td>
</tr>
<tr>
<td>C)</td>
<td>100</td>
<td>100</td>
<td>0</td>
</tr>
<tr>
<td>D)</td>
<td>100</td>
<td>20</td>
<td>40</td>
</tr>
</tbody>
</table>

   Answer: B
   Explanation: B) Small (100 × 20) + Large (40 × 100) = 6,000 total machine-hours
   Diff: 3
   Terms: product-mix decisions, constraint
   Objective: 4
   AACSB: Analytical skills
18) Favata Corporation manufactures two products, AA and CC. The following information was available:

<table>
<thead>
<tr>
<th></th>
<th>AA</th>
<th>CC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price per unit</td>
<td>$37</td>
<td>$26</td>
</tr>
<tr>
<td>Variable cost per unit</td>
<td>32</td>
<td>22</td>
</tr>
</tbody>
</table>

Total fixed costs $18,000

If Favata Corporation could produce and sell either 10,000 units of AA or 5,000 units of CC at full capacity, it should produce and sell:
A) 10,000 units of AA and none of CC
B) 3,000 units of CC and 6,000 units of AA
C) 5,000 units of CC and none of AA
D) 4,000 units of AA and 5,000 units of CC
Answer: A
Explanation: A) 10,000 × ($37-$32) = $50,000

19) Product-mix decisions are typically short-run decisions.
Answer: TRUE

20) For short-run product-mix decisions, managers should focus on minimizing total fixed costs.
Answer: FALSE
Explanation: For short-run product mix decisions, managers should focus on maximizing total contribution margin.

21) For short-run product-mix decisions, maximizing contribution margin will also result in maximizing operating income.
Answer: TRUE
22) To maximize profits, managers should produce more of the product with the greatest contribution margin per unit of the constraining resource.
Answer: TRUE
Diff: 2
Terms: decision model, constraint
Objective: 4
AACSB: Reflective thinking

23) When there is a constraining resource, the firm should attempt to maximize sales of the product or service with the greatest contribution margin per unit.
Answer: FALSE
Explanation: When there are constrained resources, the firm should attempt to maximize sales of the product or service with the greatest contribution margin per unit of the constraining resource.
Diff: 2
Terms: constraint
Objective: 4
AACSB: Reflective thinking
24) Lewis Auto Company manufactures a part for use in its production of automobiles. When 10,000 items are produced, the costs per unit are:

<table>
<thead>
<tr>
<th>Cost</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$12</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>60</td>
</tr>
<tr>
<td>Variable manufacturing overhead</td>
<td>24</td>
</tr>
<tr>
<td>Fixed manufacturing overhead</td>
<td>32</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$128</strong></td>
</tr>
</tbody>
</table>

Monty Company has offered to sell Lewis Auto Company 10,000 units of the part for $120 per unit. The plant facilities could be used to manufacture another part at a savings of $180,000 if Lewis Auto accepts the supplier's offer. In addition, $20 per unit of fixed manufacturing overhead on the original part would be eliminated.

**Required:**

a. What is the relevant per unit cost for the original part?
b. Which alternative is best for Lewis Auto Company? By how much?

**Answer:**

a. Direct materials $12
   Direct manufacturing labor 60
   Variable manufacturing overhead 24
   Avoidable fixed manufacturing overhead 20
   **Total relevant per unit costs $116**

b. 

<table>
<thead>
<tr>
<th></th>
<th>Make</th>
<th>Buy</th>
<th>Effect of Buying</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase price</td>
<td>$1,200,000</td>
<td>$(1,200,000)</td>
<td></td>
</tr>
<tr>
<td>Savings in space</td>
<td>(180,000)</td>
<td>180,000</td>
<td></td>
</tr>
<tr>
<td>Direct materials</td>
<td>$120,000</td>
<td>120,000</td>
<td></td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>600,000</td>
<td>600,000</td>
<td></td>
</tr>
<tr>
<td>Variable overhead</td>
<td>240,000</td>
<td>240,000</td>
<td></td>
</tr>
<tr>
<td>Fixed overhead saved</td>
<td>(200,000)</td>
<td>200,000</td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td>$960,000</td>
<td>$820,000</td>
<td>$140,000</td>
</tr>
</tbody>
</table>

The best alternative is to buy the part.

Diff: 2
Terms: make-or-buy decision
Objective: 2, 3, 4
AACSB: Analytical skills
25) Ralph's Mufflers manufactures three different product lines, Model X, Model Y, and Model Z. Considerable market demand exists for all models. The following per unit data apply:

<table>
<thead>
<tr>
<th></th>
<th>Model X</th>
<th>Model Y</th>
<th>Model Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selling price</td>
<td>$160</td>
<td>$180</td>
<td>$200</td>
</tr>
<tr>
<td>Direct materials</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Direct labor ($20 per hour)</td>
<td>30</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>Variable support costs ($10 per machine-hour)</td>
<td>10</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Fixed support costs</td>
<td>40</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

a. For each model, compute the contribution margin per unit.
b. For each model, compute the contribution margin per machine-hour.
c. If there is excess capacity, which model is the most profitable to produce? Why?
d. If there is a machine breakdown, which model is the most profitable to produce? Why?
e. How can Ralph encourage her sales people to promote the more profitable model?

Answer:
a. The contribution margin per unit is:
   - $60 for Model X ($160 - $90 - $30 - $10),
   - $70 for Model Y ($180 - $60 - $30 - $20),
   - and $80 for Model Z ($200 - $60 - $40 - $20).
b. The contribution margin per machine-hour is
   - $60 for Model X ($60 contribution margin / 1.0 machine-hour per unit),
   - $35 for Model Y ($70 / 2.0), and
   - $40 for Model Z ($80 / 2.0).
c. When there is excess capacity, Model Z is the most profitable because it has the greatest contribution margin per unit.
d. When there are machine-hour capacity constraints, Model X is the most profitable because it has the greatest contribution margin per constrained resource.
e. To encourage sales persons to promote specific products, Ralph may want to provide marketing incentives such as higher sales commissions for products contributing the most to profits. Ralph may also want to educate salespeople about the effects of constrained resources.

26) How does a manager go about choosing which of three products to produce and sell when each product uses a single machine with a limited capacity?

Answer: Management should attempt to maximize output from the machine which is the limited resource. This involves maximizing the contribution margin per unit of the scarce resource. First of all, management needs to determine the contribution margin of each of the three products. Then, the time that it takes to produce a unit of each of the three products should be determined. Then, a contribution margin per machine hour can be calculated. The first product that should be produced is the one with the highest contribution margin per machine hour.

Terms: product-mix decisions, constraint
Objective: 4
AACSB: Analytical skills
Objective 11.5

1) When deciding whether to discontinue a segment of a business, managers should focus on:
A) equipment used by that segment that could become idle
B) reallocation of corporate costs
C) how total costs differ among alternatives
D) operating income per unit of the discontinued segment
Answer: C
Diff: 3
Terms: differential revenue, differential cost
Objective: 5
AACSB: Reflective thinking

2) When deciding whether to discontinue a segment of a business, relevant costs include all of the following EXCEPT:
A) fixed supervision costs that can be eliminated
B) variable marketing costs per unit of product sold
C) cost of goods sold
D) future administrative costs that will continue
Answer: D
Diff: 2
Terms: relevant costs
Objective: 5
AACSB: Reflective thinking

3) Molly, Inc. is considering eliminating one of its product lines. The fixed costs currently allocated to the product line will be allocated to other product lines upon discontinuance. What financial effects occur if the product line is discontinued?
A) net income will decrease by the amount of the contribution margin of the product line being discontinued
B) the company's total fixed costs will increase
C) total fixed costs will decrease by the amount of the product line's fixed costs
D) net income will decrease by the amount of the product line's fixed costs
Answer: A
Diff: 2
Terms: relevant costs
Objective: 5
AACSB: Reflective thinking

4) Discontinuing unprofitable products will increase profitability:
A) if the resources no longer required by the discontinued product can be eliminated
B) if capacity constraints are adjusted
C) automatically
D) when a large portion of the fixed costs are unavoidable
Answer: A
Diff: 2
Terms: relevant revenues, relevant costs
Objective: 5
AACSB: Reflective thinking
5) A segment has the following data:

Sales $300,000
Variable costs 160,000
Fixed costs 155,000

What will be the incremental effect on net income if this segment is eliminated, assuming the fixed costs will be allocated to profitable segments?
A) $15,000 increase
B) $155,000 decrease
C) $140,000 decrease
D) $145,000 decrease
Answer:  C
Explanation:  C) $300,000 – $160,000 = $140,000 decrease
Diff: 2
Terms:  relevant costs
Objective:  5
AACSB:  Analytical skills

6) Camera Corner is considering eliminating Model AE2 from its camera line because of losses over the past quarter. The past three months of information for Model AE2 are summarized below:

Sales (1,000 units) $300,000
Manufacturing costs:
  Direct materials  150,000
  Direct labor ($15 per hour)  60,000
  Overhead  100,000
  Operating loss ($10,000)

Overhead costs are 70% variable and the remaining 30% is depreciation of special equipment for model AE2 that has no resale value.

If Model AE2 is dropped from the product line, operating income will:
A) increase by $10,000
B) decrease by $20,000
C) increase by $30,000
D) decrease by $10,000
Answer:  B
Explanation:  B) $300,000 - $150,000 - $60,000 - $70,000 = $20,000 This product contributes $20,000 toward corporate profits, therefore, discontinuing this product will decrease operating income by $20,000.
Diff: 3
Terms:  relevant revenues, relevant costs
Objective:  5
AACSB:  Analytical skills
Answer the following questions using the information below:

The management accountant for Giada’s Book Store has prepared the following income statement for the most current year:

<table>
<thead>
<tr>
<th></th>
<th>Cookbook</th>
<th>Travel Book</th>
<th>Classics</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$60,000</td>
<td>$100,000</td>
<td>$40,000</td>
<td>$200,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>36,000</td>
<td>65,000</td>
<td>20,000</td>
<td>121,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>24,000</td>
<td>35,000</td>
<td>20,000</td>
<td>79,000</td>
</tr>
<tr>
<td>Order and delivery processing</td>
<td>18,000</td>
<td>21,000</td>
<td>8,000</td>
<td>47,000</td>
</tr>
<tr>
<td>Rent (per sq. foot used)</td>
<td>2,000</td>
<td>1,000</td>
<td>3,000</td>
<td>6,000</td>
</tr>
<tr>
<td>Allocated corporate costs</td>
<td>7,000</td>
<td>7,000</td>
<td>7,000</td>
<td>21,000</td>
</tr>
<tr>
<td>Corporate profit</td>
<td>$(3,000)</td>
<td>$6,000</td>
<td>$2,000</td>
<td>$5,000</td>
</tr>
</tbody>
</table>

7) If the cookbook product line had been discontinued prior to this year, the company would have reported:
A) greater corporate profits
B) the same amount of corporate profits
C) less corporate profits
D) resulting profits cannot be determined
Answer: C
Explanation: C) $60,000 - $36,000 - $18,000 - $2,000 = $4,000
The cookbook product line contributed $4,000 toward corporate profits. Without the cookbooks, corporate profits would be $4,000 less than currently reported.

Diff: 3
Terms: relevant revenues, relevant costs
Objective: 5
AACSB: Analytical skills

8) If the travel book line had been discontinued, corporate profits for the current year would have decreased by:
A) $35,000
B) $14,000
C) $13,000
D) $6,000
Answer: C
Explanation: C) $100,000 - $65,000 - $21,000 - $1,000 = $13,000
Diff: 3
Terms: relevant revenues, relevant costs
Objective: 5
AACSB: Analytical skills
Answer the following questions using the information below:

Rambo Company has three products, A, B, and C. The following information is available:

<table>
<thead>
<tr>
<th></th>
<th>Product A</th>
<th>Product B</th>
<th>Product C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$60,000</td>
<td>$90,000</td>
<td>$24,000</td>
</tr>
<tr>
<td>Variable costs</td>
<td>36,000</td>
<td>48,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>24,000</td>
<td>42,000</td>
<td>9,000</td>
</tr>
<tr>
<td>Fixed costs:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Avoidable</td>
<td>6,000</td>
<td>15,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Unavoidable</td>
<td>7,000</td>
<td>9,000</td>
<td>5,400</td>
</tr>
<tr>
<td>Operating income</td>
<td>$11,000</td>
<td>$18,000</td>
<td>$(400)</td>
</tr>
</tbody>
</table>

9) Rambo Company is thinking of dropping Product C because it is reporting a loss. Assuming Rambo drops Product C and does NOT replace it, operating income will:
   A) increase by $400
   B) increase by $4,000
   C) decrease by $5,000
   D) decrease by $9,400

   Answer: C
   Explanation: C) Dropping Product C would mean Rambo gives up $9,000 in contribution margin while only saving $4,000 in avoidable fixed costs. Without Product C, operating income would be $5,000 less than currently reported.
   Diff: 3
   Terms: relevant revenues, relevant costs
   Objective: 5
   AACSB: Analytical skills

10) Assuming Product C is discontinued and the space formerly used to produce Product C is rented for $12,000 per year, operating income will:
   A) increase by $4,600
   B) increase by $7,000
   C) increase by $12,000
   D) increase by $12,400

   Answer: B
   Explanation: B) $12,000 - $5,000 = $7,000
   Diff: 3
   Terms: relevant revenues, relevant costs, opportunity cost
   Objective: 5
   AACSB: Analytical skills

11) Management should focus on per unit costs when deciding whether to discontinue a product or not.
   Answer: FALSE
   Explanation: Management should focus on total costs when deciding whether to discontinue a product or not.
   Diff: 2
   Terms: full costs of the product
   Objective: 5
   AACSB: Ethical reasoning
12) Avoidable variable and fixed costs should be evaluated when deciding whether to discontinue a product, product line, business segment, or customer.
Answer: TRUE
Diff: 2
Terms: differential cost
Objective: 5
AACSB: Ethical reasoning

13) All corporate-office allocated costs should be included in relevant-cost analysis.
Answer: FALSE
Explanation: Only costs that will change between alternatives should be considered.
Diff: 2
Terms: relevant costs
Objective: 5
AACSB: Ethical reasoning

14) Depreciation allocated to a product line is a relevant cost when deciding to discontinue that product.
Answer: FALSE
Explanation: Depreciation is a sunk cost and never relevant.
Diff: 2
Terms: relevant costs
Objective: 5
AACSB: Reflective thinking

15) A company is considering adding a fourth product to use available capacity. A relevant factor to consider is that corporate costs can now be allocated over four products rather than only three.
Answer: FALSE
Explanation: It appears that corporate costs will not change in total, and therefore they are not relevant costs for deciding whether to add a fourth product.
Diff: 3
Terms: relevant costs
Objective: 5
AACSB: Reflective thinking

16) All variable costs are relevant and all fixed costs are irrelevant.
Answer: FALSE
Explanation: All variable costs are not necessarily relevant and all fixed costs are not necessarily irrelevant.
Diff: 2
Terms: relevant costs
Objective: 5
AACSB: Reflective thinking

17) In a decision as to whether or not to drop a product, fixed costs that have been allocated to that product are generally not relevant.
Answer: TRUE
Diff: 2
Terms: relevant costs
Objective: 5
AACSB: Reflective thinking
18) Kirkland Company manufactures a part for use in its production of hats. When 10,000 items are produced, the costs per unit are:

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>Cost Per Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$0.60</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>3.00</td>
</tr>
<tr>
<td>Variable manufacturing overhead</td>
<td>1.20</td>
</tr>
<tr>
<td>Fixed manufacturing overhead</td>
<td>1.60</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$6.40</strong></td>
</tr>
</tbody>
</table>

Mike Company has offered to sell to Kirkland Company 10,000 units of the part for $6.00 per unit. The plant facilities could be used to manufacture another item at a savings of $9,000 if Kirkland accepts the offer. In addition, $1.00 per unit of fixed manufacturing overhead on the original item would be eliminated.

**Required:**

a. What is the relevant per unit cost for the original part?
b. Which alternative is best for Kirkland Company? By how much?

**Answer:**

a. Direct materials $0.60  
   Direct manufacturing labor 3.00  
   Variable manufacturing overhead 1.20  
   Avoidable fixed manufacturing overhead 1.00  
   **Total relevant per unit costs $5.80**

<table>
<thead>
<tr>
<th></th>
<th>Make</th>
<th>Buy</th>
<th>Effect of Buying</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase price</td>
<td>$60,000</td>
<td>$(60,000)</td>
<td></td>
</tr>
<tr>
<td>Savings in space</td>
<td>(9,000)</td>
<td>9,000</td>
<td></td>
</tr>
<tr>
<td>Direct materials</td>
<td>$6,000</td>
<td>6,000</td>
<td></td>
</tr>
<tr>
<td>Direct mfg. labor</td>
<td>30,000</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>Variable overhead</td>
<td>12,000</td>
<td>12,000</td>
<td></td>
</tr>
<tr>
<td>Fixed overhead saved</td>
<td>(10,000)</td>
<td>10,000</td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>$48,000</strong></td>
<td><strong>$41,000</strong></td>
<td><strong>$7,000</strong></td>
</tr>
</tbody>
</table>

The best alternative is to buy the part.

Diff: 2
Terms: make-or-buy decision
Objective: 2, 4, 5
AACSB: Analytical skills
19) Hasselhoff Camera is considering eliminating Model EOS1 from its camera line because of losses over the past quarter. The past three months of information for model EOS1 is summarized below:

Sales (1,000 units) $250,000
Manufacturing costs:
  Direct materials 90,000
  Direct labor ($15 per hour) 80,000
  Support 100,000
Operating loss ($20,000)

Support costs are 70% variable and the remaining 30% is depreciation of special equipment for model EOS1 that has no resale value.

Should Hasselhoff Camera eliminate Model EOS1 from its product line? Why or why not?
Answer: No, Hasselhoff Camera should not eliminate Model EOS1 from its product line because it contributes $10,000 toward fixed costs and profits.

Sales (1,000 units) $250,000
Manufacturing costs:
  Direct materials 90,000
  Direct labor 80,000
  Variable support ($100,000 × 70%) 70,000
Contribution margin $10,000

Diff: 2
Terms: product-mix decisions
Objective: 5
AACSB: Analytical skills
20) The management accountant for the Chocolate S'more Company has prepared the following income statement for the most current year:

<table>
<thead>
<tr>
<th></th>
<th>Chocolate</th>
<th>Other Candy</th>
<th>Fudge</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$40,000</td>
<td>$25,000</td>
<td>$35,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>26,000</td>
<td>15,000</td>
<td>19,000</td>
<td>60,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>14,000</td>
<td>10,000</td>
<td>16,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Delivery and ordering costs</td>
<td>2,000</td>
<td>3,000</td>
<td>2,000</td>
<td>7,000</td>
</tr>
<tr>
<td>Rent (per sq. foot used)</td>
<td>3,000</td>
<td>3,000</td>
<td>2,000</td>
<td>8,000</td>
</tr>
<tr>
<td>Allocated corporate costs</td>
<td>5,000</td>
<td>5,000</td>
<td>5,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Corporate profit</td>
<td>$4,000</td>
<td>$(1,000)</td>
<td>$7,000</td>
<td>$10,000</td>
</tr>
</tbody>
</table>

a. Do you recommend discontinuing the Other Candy product line? Why or why not?
b. If the Chocolate product line had been discontinued, corporate profits for the current year would have decreased by what amount?

Answer:
a. No, I would not recommend discontinuing the Other Candy product line because this product line contributes $4,000 towards corporate costs and profits.
   
   $25,000 - $15,000 - $3,000 - $3,000 = $4,000

   Without the Other Candy product line, corporate profits would be $4,000 less than currently reported.

b. If the Chocolate product line were discontinued, corporate profits would immediately decrease by $9,000.
   
   $40,000 - $26,000 - $2,000 - $3,000 = $9,000

Diff: 3
Terms: product-mix decisions
Objective: 5
AACSB: Analytical skills
21) Clinton Company sells two items, product A and product B. The company is considering dropping product B. It is expected that sales of product A will increase by 405 as a result. Dropping product B will allow the company to cancel its monthly equipment rental costing $100 per month. The other existing equipment will be used for additional production of product A. One employee earning $200 per month can be terminated if product B production is dropped. Clinton's other fixed costs are allocated and will continue regardless of the decision made. A condensed, budgeted monthly income statement with both products follows:

<table>
<thead>
<tr>
<th></th>
<th>Product A</th>
<th>Product B</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$10,000</td>
<td>$8,000</td>
<td>$18,000</td>
</tr>
<tr>
<td>Direct materials</td>
<td>2,500</td>
<td>2,000</td>
<td>4,500</td>
</tr>
<tr>
<td>Direct labor</td>
<td>2,000</td>
<td>1,200</td>
<td>3,200</td>
</tr>
<tr>
<td>Equipment rental</td>
<td>300</td>
<td>2,600</td>
<td>2,900</td>
</tr>
<tr>
<td>Other allocated overhead</td>
<td>1,000</td>
<td>2,100</td>
<td>3,100</td>
</tr>
<tr>
<td>Operating income</td>
<td>$4,200</td>
<td>$100</td>
<td>$4,300</td>
</tr>
</tbody>
</table>

Required:
Prepare an incremental analysis to determine the financial effect of dropping product B.

Answer: Incremental change in revenue:
- Product A increase in sales $10,000 × 40% = $4,000
- Product B decrease in sales (8,000)
Incremental decrease in revenue = ($4,000)

Incremental change in variable costs:
- Direct materials: Product A increase $2,500 × 40% = (1,000)
- Product B decrease 2,000
- Direct labor: Product A increase $2,000 × 40% = (800)
- Product B decrease 200
Incremental decrease in variable costs = 400

Equipment rental deduction = 100
Incremental decrease in profits if product B is dropped = ($3,500)
Diff: 3
Terms: relevant costs, relevant revenues
Objective: 5
AACSB: Analytical skills
22) Doggie Dinner, Inc., currently manufactures three different types of scientifically balanced dog food. The firm is considering eliminating one of the three products. What factors should be taken into account in making this decision?

Answer: In deciding whether or not to eliminate a product, the firm should determine if costs that can be eliminated will exceed the revenues that will be lost. The firm needs to classify the costs into those costs which will be eliminated and therefore are relevant, and which costs will continue even if the product is deleted. Costs that often continue are those costs which have been allocated rather than incurred directly by the product. The firm must also look to see if any other products may be harmed by the elimination of the product. Maybe the products are complements, and loss of one sale will result in loss of another. The firm should consider whether another product's sales might increase if the product is deleted, which could be an opportunity to earn more contribution from another area. Can the firm use the space freed up for some other purpose that could generate additional inflows, which is an opportunity cost? The firm must also look at how its reputation among its customers for selling a full line of products might be damaged as a result of this decision.

Diff: 2
Terms: product-mix decisions
Objective: 5
AACSB: Reflective thinking

Answer the following questions using the information below:

Melodee's Preserves currently makes jams and jellies and a variety of decorative jars used for packaging. An outside supplier has offered to supply all of the needed decorative jars. For this make-or-buy decision, a cost analysis revealed the following avoidable unit costs for the decorative jars:

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Cost per Jar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$0.25</td>
</tr>
<tr>
<td>Direct labor</td>
<td>0.03</td>
</tr>
<tr>
<td>Unit-related support costs</td>
<td>0.10</td>
</tr>
<tr>
<td>Batch-related support costs</td>
<td>0.12</td>
</tr>
<tr>
<td>Product-sustaining support costs</td>
<td>0.22</td>
</tr>
<tr>
<td>Facility-sustaining support costs</td>
<td>0.28</td>
</tr>
<tr>
<td><strong>Total cost per jar</strong></td>
<td><strong>$1.00</strong></td>
</tr>
</tbody>
</table>

23) The relevant cost per jar is:

A) $0.28 per jar
B) $0.38 per jar
C) $0.72 per jar
D) $1.00 per jar

Answer: D
Explanation: D) All avoidable costs are relevant for this decision.

Diff: 2
Terms: relevant costs
Objective: 2, 5
AACSB: Analytical skills
24) The maximum price that Melodee's Preserves should be willing to pay for the decorative jars is:
A) $0.28 per jar
B) $0.38 per jar
C) $0.72 per jar
D) $1.00 per jar
Answer: D
Explanation: D) Considering only quantitative factors, the company should not pay more than the avoidable costs of $1.00 per jar. There may be qualitative factors that are also important.
Diff: 2
Terms: relevant costs
Objective: 2, 5
AACSB: Analytical skills

Objective 11.6

1) Costs are relevant to a particular decision if they:
A) are variable costs
B) are fixed costs
C) differ across the alternatives being considered
D) remain unchanged across the alternatives being considered
Answer: C
Diff: 2
Terms: relevant costs
Objective: 6
AACSB: Reflective thinking

2) When deciding to lease a new cutting machine or continue using the old machine, the following costs are relevant EXCEPT the:
A) $50,000 cost of the old machine
B) $20,000 cost of the new machine
C) $10,000 selling price of the old machine
D) $3,000 annual savings in operating costs if the new machine is purchased
Answer: A
Diff: 2
Terms: relevant costs
Objective: 6
AACSB: Reflective thinking

3) For machine-replacement decisions, depreciation is a cost that is:
A) not relevant
B) differential
C) incremental
D) variable
Answer: A
Diff: 1
Terms: relevant costs
Objective: 6
AACSB: Reflective thinking
4) ________ is relevant in a decision to replace equipment.
A) Cost of old equipment  
B) Book value of old equipment  
C) Accumulated depreciation on old equipment  
D) Future maintenance costs of old equipment  
Answer: D  
Diff: 1  
Terms: relevant costs  
Objective: 6  
AACSB: Reflective thinking  

5) In a decision to keep or replace existing equipment, ________ is a FALSE statement.
A) the book value of the old equipment is irrelevant  
B) the disposal value of the old equipment is irrelevant  
C) the cost of the new equipment is relevant  
D) depreciation on the new equipment is relevant  
Answer: B  
Diff: 1  
Terms: relevant costs  
Objective: 6  
AACSB: Reflective thinking  

6) A company decided to replace an old machine with a new machine. Which of the following is considered a relevant cost?
A) the book value of the old equipment  
B) depreciation expense on the old equipment  
C) the loss on the disposal of the old equipment  
D) the current disposal price of the old equipment  
Answer: D  
Diff: 1  
Terms: relevant costs  
Objective: 6  
AACSB: Reflective thinking  

7) What role does a trade-in allowance on old equipment play in a decision to retain or replace equipment?
A) it is relevant since it increases the cost of the new equipment  
B) it is not relevant since it reduces the cost of the old equipment  
C) it is not relevant to the decision since it does not impact the cost of the new equipment  
D) it is relevant since it reduces the cost of the new equipment  
Answer: D  
Diff: 1  
Terms: relevant costs, relevant revenues  
Objective: 6  
AACSB: Reflective thinking
Answer the following questions using the information below:

Pizza For Everyone is considering replacing its existing delivery van with a new one. The new van can offer considerable savings in operating costs. Information about the existing van and the new van follow:

<table>
<thead>
<tr>
<th></th>
<th><strong>Existing Van</strong></th>
<th><strong>New Van</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Original cost</td>
<td>$50,000</td>
<td>$90,000</td>
</tr>
<tr>
<td>Annual operating cost</td>
<td>$17,500</td>
<td>$10,000</td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>$30,000</td>
<td>$0</td>
</tr>
<tr>
<td>Current salvage value of the existing van</td>
<td>$22,500</td>
<td>$0</td>
</tr>
<tr>
<td>Remaining life</td>
<td>10 years</td>
<td>10 years</td>
</tr>
<tr>
<td>Salvage value in 10 years</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Annual depreciation</td>
<td>$2,000</td>
<td>$9,000</td>
</tr>
</tbody>
</table>

8) Sunk costs include:
A) the original cost of the existing van
B) the original cost of the new van
C) the current salvage value of the existing van
D) the annual operating cost of the new van

Answer: A
Diff: 2
Terms: sunk costs
Objective: 6
AACSB: Reflective thinking

9) Relevant costs for this decision include:
A) the original cost of the existing van
B) accumulated depreciation
C) the current salvage value
D) the salvage value in 10 years

Answer: C
Diff: 2
Terms: relevant costs
Objective: 6
AACSB: Reflective thinking

10) If Pizza For Everyone replaces the existing delivery van with the new one, over the next 10 years operating income will:
A) decrease by $90,000
B) increase by $75,000
C) decrease by $75,000
D) None of these answers is correct.

Answer: B
Explanation: B) New van ($10,000 × 10 years) - Existing van ($17,500 × 10 years) = $75,000 less in operating costs, which results in a $75,000 increase in operating income.
Diff: 3
Terms: relevant revenues, relevant costs
Objective: 6
AACSB: Analytical skills
Answer the following questions using the information below:

Victoria, Inc., is considering replacing a machine. The following data are available:

<table>
<thead>
<tr>
<th></th>
<th>Old Machine</th>
<th>Replacement Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original cost</td>
<td>$90,000</td>
<td>$70,000</td>
</tr>
<tr>
<td>Useful life in years</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Current age in years</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Book value</td>
<td>$50,000</td>
<td></td>
</tr>
<tr>
<td>Disposal value now</td>
<td>$16,000</td>
<td></td>
</tr>
<tr>
<td>Disposal value in 5 years</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Annual cash operating costs</td>
<td>$14,000</td>
<td>$8,000</td>
</tr>
</tbody>
</table>

11) Which of the data provided in the table is a sunk cost?
A) the annual cash operating costs of the old machine
B) the annual cash operating costs of the replacement machine
C) the disposal value of the old machine
D) the original cost of the old machine
Answer: D
Diff: 2
Terms: sunk costs
Objective: 6
AACSB: Analytical skills

12) For the decision to keep the old machine, the relevant costs of keeping the old machine total:
A) $120,000
B) $70,000
C) $94,000
D) $144,000
Answer: B
Explanation: B) $14,000 × 5 = $70,000
Diff: 3
Terms: relevant costs
Objective: 6
AACSB: Analytical skills

13) The difference between keeping the old machine and replacing the old machine is:
A) $74,000 in favor of keeping the old machine
B) $24,000 in favor of keeping the old machine
C) $74,000 in favor of replacing the old machine
D) $24,000 in favor of replacing the old machine
Answer: B
Explanation: B) New [$70,000 + (5 × $8,000)] - Old [$16,000 + (5 × $14,000)] = $24,000
Diff: 3
Terms: relevant costs
Objective: 6
AACSB: Analytical skills
14) The difference between the original cost of an asset and the accumulated depreciation is known as the:
A) historical cost
B) market value
C) book value
D) depreciable cost
Answer: C
Diff: 1
Terms: relevant costs
Objective: 6
AACSB: Reflective thinking

15) When replacing an old machine with a new machine, the purchase price of the old machine is a relevant cost.
Answer: FALSE
Explanation: When replacing an old machine with a new machine, the purchase price of the old machine is a sunk cost and never relevant.
Diff: 1
Terms: relevant costs
Objective: 6
AACSB: Reflective thinking

16) When replacing an old machine with a new machine, the trade in value of the old machine is relevant.
Answer: TRUE
Diff: 1
Terms: relevant costs
Objective: 6
AACSB: Reflective thinking

17) When replacing an old machine with a new machine, the book value of the old machine is a relevant cost.
Answer: FALSE
Explanation: The original price of the old machine and the related accumulated depreciation is a sunk cost and therefore an irrelevant cost.
Diff: 1
Terms: relevant costs
Objective: 6
AACSB: Reflective thinking
18) Pat, a Pizzeria manager, replaced the convection oven just six months ago. Today, Turbo Ovens Manufacturing announced the availability of a new convection oven that cooks more quickly with lower operating expenses. Pat is considering the purchase of this faster, lower-operating cost convection oven to replace the existing one they recently purchased. Selected information about the two ovens is given below:

<table>
<thead>
<tr>
<th></th>
<th>Existing</th>
<th>New Turbo Oven</th>
</tr>
</thead>
<tbody>
<tr>
<td>Original cost</td>
<td>$60,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>Accumulated depreciation</td>
<td>$5,000</td>
<td></td>
</tr>
<tr>
<td>Current salvage value</td>
<td>$40,000</td>
<td></td>
</tr>
<tr>
<td>Remaining life</td>
<td>5 years</td>
<td>5 years</td>
</tr>
<tr>
<td>Annual operating expenses</td>
<td>$10,000</td>
<td>$7,500</td>
</tr>
<tr>
<td>Disposal value in 5 years</td>
<td>$0</td>
<td>$0</td>
</tr>
</tbody>
</table>

**Required:**

a. What costs are sunk?

b. What costs are relevant?

c. What are the net cash flows over the next 5 years assuming the Pizzeria purchases the new convection oven?

d. What other items should Pat, as manager of the Pizzeria, consider when making this decision?

**Answer:**

a. Sunk costs include the original cost of the existing convection oven and the accompanying accumulated depreciation.

b. Relevant costs include:
   - Acquisition cost of the new Turbo oven
   - Current disposal value of the existing convection oven
   - Differences in annual operating expenses for the existing and the new Turbo oven

c. Net cash flows over 5 years with the new Turbo oven:

   **Cash inflow:**
   - Decrease in annual operating expenses ($2,500 × 5) $12,500
   - Sale of the existing oven 40,000

   **Cash outflow:**
   - Acquisition of the new Turbo oven (50,000)
   - Net cash inflow (outflow) $2,500

d. Other items the manager should consider when making this decision include:
   - The Turbo oven's reliability and efficiency is still unknown since it is a brand-new product.
   - If the Turbo oven bakes faster as it claims, the Pizzeria may be able to increase sales due to the quicker baking time.
   - After purchasing another oven just six months prior, top management should consider the Turbo oven option, but instead may question the decision-making ability of Pat, the current manager.

Diff: 2
Terms: relevant costs, sunk costs
Objective: 6
AACSB: Analytical skills

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19) Why is the book value of old equipment irrelevant to the equipment replacement decision? 
Answer: The book value of old equipment is made up of the cost and accumulated depreciation, both of which are sunk costs and therefore irrelevant.
Diff: 2
Terms: relevant costs, sunk costs
Objective: 6
AACSB: Reflective thinking

Objective 11.7

1) Managers tend to favor the alternative that makes their performance look best. Therefore, they tend to focus on:
A) how to implement the chosen alternative
B) the measures used in the decision model
C) the measures used in the performance evaluation model
D) gathering the required information
Answer: C
Diff: 2
Terms: decision model
Objective: 7
AACSB: Ethical reasoning

2) If management takes a multiple-year view in the decision model and judges success according to the current year's results, a problem will occur in the:
A) decision model
B) performance evaluation model
C) production evaluation model
D) quantitative model
Answer: B
Diff: 2
Terms: decision model
Objective: 7
AACSB: Reflective thinking

3) Top management faces a persistent challenge to make sure that the performance evaluation model of lower level managers is:
A) focused on short-term performance
B) based solely on quantitative factors
C) consistent with the decision model
D) not consistent with the decision model
Answer: C
Diff: 2
Terms: decision model
Objective: 7
AACSB: Reflective thinking
4) The three steps involved in linear programming include all of the following EXCEPT:
A) determining the objective
B) determining the basic relationship
C) computing the optimal solution
D) determining the relevant and irrelevant costs
Answer: D
Diff: 2
Terms: linear programming (LP)
Objective: 7
AACSB: Reflective thinking

5) In linear programming, the goals of management are expressed in:
A) an objective function
B) constraints
C) operating policies
D) business functions
Answer: A
Diff: 1
Terms: linear programming (LP)
Objective: 7
AACSB: Reflective thinking

6) A mathematical inequality or equality that must be appeased is known as a(n):
A) objective function
B) constraint
C) operating policy
D) business function
Answer: B
Diff: 2
Terms: linear programming (LP), constraint
Objective: 7
AACSB: Reflective thinking
7) Computer Products produces two keyboards, Regular and Special. Regular keyboards have a unit contribution margin of $128, and Special keyboards have a unit contribution margin of $720. The demand for Regulars exceeds Computer Product's production capacity, which is limited by available machine-hours and direct manufacturing labor-hours. The maximum demand for Special keyboards is 80 per month. Management desires a product mix that will maximize the contribution toward fixed costs and profits.

Direct manufacturing labor is limited to 1,600 hours a month and machine-hours are limited to 1,200 a month. The Regular keyboards require 20 hours of labor and 8 machine-hours. Special keyboards require 34 labor-hours and 20 machine-hours.

Let R represent Regular keyboards and S represent Special keyboards. The correct set of equations for the keyboard production process is:

A) Maximize: $128R + $720S
Constraints:
  Labor-hours: 20R + 34S ≤ 1,600
  Machine-hours: 8R + 20S ≤ 1,200
  Special: S ≤ 80
  S ≥ 0
  Regular: R ≥ 0
B) Maximize: $128R + $720S
Constraints:
  Labor-hours: 20R + 34S ≥ 1,600
  Machine-hours: 8R + 20S ≥ 1,200
  Special: S ≥ 80
  S ≥ 0
  Regular: R ≥ 0
C) Maximize: $720S + $128R
Constraints:
  Labor-hours: 20R + 8S ≤ 1,600
  Machine-hours: 34R + 20S ≤ 1,200
  Special: S ≤ 80
  S ≥ 0
  Regular: R ≥ 0
D) Maximize: $128R + $720S
Constraints:
  Labor-hours: 20R + 34S ≤ 1,600
  Machine-hours: 8R + 20S ≤ 1,200
  Special: S ≥ 80
  S ≤ 0
  Regular: R ≤ 0

Answer: A
Diff: 3
Terms: linear programming (LP), constraint
Objective: 7
AACSB: Use of Information Technology
8) Replacing an old machine will increase operating income in the long run, but NOT for this year. A manager may choose not to replace the machine if performance evaluations are based on performance over a single year.
Answer: TRUE
Diff: 2
Terms: decision model
Objective: 7
AACSB: Ethical reasoning

9) Managers tend to favor alternatives that make their own performance look better.
Answer: TRUE
Diff: 2
Terms: decision model
Objective: 7
AACSB: Ethical reasoning

10) How can conflicts arise between the decision model and the performance evaluation model used to evaluate managers? Provide an example of this type of conflict.
Answer: Since managers will act in their self interest, they will make decisions that make their own performance look best. At times, this does not lead to the best decision for the firm. An example of this situation might include evaluating a managers performance on short-term results, when the firm would like decisions made that would maximize long term performance.
Diff: 2
Terms: decision model
Objective: 7
AACSB: Reflective thinking

Objective 11.A

1) Linear programming is a tool that maximizes total contribution margin of a mix of products with multiple constraints.
Answer: TRUE
Diff: 1
Terms: linear programming (LP)
Objective: A
AACSB: Reflective thinking
2) Local Steel Construction Company produces two products, steel and wood beams. Steel beams have a unit contribution margin of $200, and wood beams have a unit contribution margin of $150. The demand for steel beams exceeds Local Steel Construction Company's production capacity, which is limited by available direct labor and machine-hours. The maximum demand for wood beams is 90 per week. Management desires that the product mix should maximize the weekly contribution toward fixed costs and profits.

Direct manufacturing labor is limited to 3,000 hours a week and 1,000 hours is all that the company's outdated machines can run a week. The steel beams require 120 hours of labor and 60 machine-hours. Wood beams require 150 labor hours and 120 machine-hours.

**Required:**
Formulate the objective function and constraints necessary to determine the optimal product mix.
Answer: \( S = \) steel beams \( \quad W = \) wood beams

Maximize: \( \$200S + \$150W \)

Constraints:
- Labor hours: \( 120S + 150W \leq 3,000 \)
- Machine-hours: \( 60S + 120W \leq 1,000 \)
- Wood beams: \( W \leq 90 \quad W \geq 0 \)
- Steel beams: \( S \geq 0 \)

Diff: 2
Terms: linear programming (LP)
Objective: A
AACSB: Analytical skills
Objective 12.1

1) Companies should only produce and sell units as long as:
A) there is customer demand for the product
B) the competition allows it
C) the revenue from an additional unit exceeds the cost of producing it
D) there is a generous supply of low-cost direct materials
Answer: C
Diff: 2
Terms: target price
Objective: 1
AACSB: Ethical reasoning

2) Too high a price may:
A) deter a customer from purchasing a product
B) increase demand for the product
C) indicate supply is too plentiful
D) decrease a competitor's market share
Answer: A
Diff: 1
Terms: target price
Objective: 1
AACSB: Reflective thinking

3) Companies must always examine their pricing:
A) based on the supply of the product
B) based on the cost of producing the product
C) through the eyes of their customers
D) through the eyes of their competitors
Answer: C
Diff: 3
Terms: target price
Objective: 1
AACSB: Ethical reasoning

4) Competitors:
A) with alternative products can force a company to lower its prices
B) can gain a competitive pricing advantage with knowledge of your costs and operating policies
C) may span international borders
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: target price
Objective: 1
AACSB: Reflective thinking
5) Fluctuations in exchange rates between different currencies can influence the:
A) cost of products using foreign suppliers
B) pricing of alternative products offered by foreign competitors
C) demand for products of foreign competitors
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: target price
Objective: 1
AACSB: Multiculturalism and diversity

6) The cost of producing a product:
A) in highly competitive markets controls pricing
B) affects the willingness of a company to supply a product
C) for pricing decisions includes manufacturing costs, but not product design costs
D) None of these answers are correct.
Answer: B
Diff: 3
Terms: cost incurrence
Objective: 1
AACSB: Reflective thinking

7) In a noncompetitive environment, the key factor affecting pricing decisions is the:
A) customer's willingness to pay
B) price charged for alternative products
C) cost of producing and delivering the product
D) All of these answers are correct.
Answer: A
Diff: 3
Terms: target price
Objective: 1
AACSB: Reflective thinking

8) In a competitive market with differentiated products like cameras, the key factor(s) affecting pricing decisions is/are the:
A) customer's willingness to pay
B) price charged for alternative products
C) cost of producing and delivering the product
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: target price
Objective: 1
AACSB: Reflective thinking
9) Three major influences on pricing decisions are:
A) competition, costs, and customers
B) competition, demand, and production efficiency
C) continuous improvement, customer satisfaction, and supply
D) variable costs, fixed costs, and mixed costs
Answer: A

10) Companies must always examine pricing decisions through the eyes of their customers.
Answer: TRUE

11) Companies that produce high quality products do NOT have to pay attention to the actions of their competitors.
Answer: FALSE
Explanation: No business operates in a vacuum. Companies must always be aware of the actions of their competitors.

12) Relevant costs for pricing decisions include manufacturing costs, but NOT costs from other value-chain functions.
Answer: FALSE
Explanation: Relevant costs for pricing decisions include costs from all value-chain functions, from R&D to customer service.

13) Prices are decreased when demand is weak and competition is strong and increased when demand is strong and competition is weak.
Answer: TRUE
14) In markets with little or no competition, the key factor affecting price is the customers' willingness to pay, not costs or competitors.
Answer: TRUE
Diff: 2
Terms: value-added cost
Objective: 1
AACSB: Reflective thinking

15) When prices are set in a competitive marketplace, product costs are the most important influence on pricing decisions.
Answer: FALSE
Explanation: When prices are set in a competitive marketplace, companies have no control over setting prices and must accept the price determined by the market.
Diff: 2
Terms: target price
Objective: 1
AACSB: Reflective thinking

16) The only competition a firm must be concerned about when setting prices are those in the local market.
Answer: FALSE
Explanation: A firm must be concerned with local, national and even international competition when setting a price.
Diff: 2
Terms: target price
Objective: 1
AACSB: Reflective thinking

17) Claudia Geer, controller, discusses the pricing of a new product with the sales manager, James Nolan. What major influences must Claudia and James consider in pricing the new product? Discuss each briefly.
Answer: The major influences are customers, competitors, and costs.

**Customers:** Managers must always examine pricing problems through the eyes of their customers. A price increase may cause customers to reject a company's product and choose a competing or substitute product.

**Competitors:** Competitors' reactions influence pricing decisions. At one extreme, a rival's prices and products may force a business to lower its prices to be competitive. At the other extreme, a business without a rival in a given situation can set higher prices. A business with knowledge of its rivals' technology, plant capacity, and operating policies is able to estimate its rivals' costs, which is valuable information in setting competitive prices.

**Costs:** Companies price products to exceed the costs of making them. The study of cost-behavior patterns gives insight into the income that results from different combinations of price and output quantities sold for a particular product.
Diff: 2
Terms: target price
Objective: 1
AACSB: Reflective thinking
Objective 12.2

1) Short-term pricing decisions:
A) use costs that may be irrelevant for long-term pricing decisions
B) are more opportunistic
C) tend to decrease prices when demand is strong
D) have a time horizon of more than one year
Answer: B
Diff: 3
Terms: target price
Objective: 2
AACSB: Reflective thinking

2) Relevant costs for pricing a special order include:
A) existing fixed manufacturing overhead
B) nonmanufacturing costs that will not change even if the special order is accepted
C) additional setup costs for the special order
D) All of these answers are correct.
Answer: C
Diff: 2
Terms: cost incurrence
Objective: 2
AACSB: Reflective thinking

3) Which of the following factors should NOT be considered when pricing a special order?
A) the likely bids of competitors
B) the incremental cost of one unit of product
C) revenues that will be lost on existing sales if prices are lowered
D) stable pricing to earn the desired long-run return
Answer: D
Diff: 3
Terms: target price
Objective: 2
AACSB: Reflective thinking

4) A price-bidding decision for a one-time-only special order includes an analysis of all:
A) manufacturing costs
B) cost drivers related to the product
C) direct and indirect variable costs of each function in the value chain
D) fixed manufacturing costs
Answer: C
Diff: 2
Terms: cost incurrence
Objective: 2
AACSB: Reflective thinking
5) For pricing decisions, full product costs:
A) include all costs that are traceable to the product
B) include all manufacturing and selling costs
C) include all direct costs plus an appropriate allocation of the indirect costs of all business functions
D) allow for the highest possible product prices

Answer: C
Diff: 2
Terms: cost incurrence
Objective: 2
AACSB: Reflective thinking

Answer the following questions using the information below:

Black Forrest manufactures rustic furniture. The cost accounting system estimates manufacturing costs to be $240 per table, consisting of 60% variable costs and 40% fixed costs. The company has surplus capacity available. It is Black Forrest policy to add a 50% markup to full costs.

6) Black Forrest is invited to bid on a one-time-only special order to supply 200 rustic tables. What is the lowest price Black Forrest should bid on this special order?
A) $43,200
B) $14,400
C) $24,000
D) $28,800

Answer: D
Explanation: D) $240 × 60% × 200 tables = $28,800
Diff: 2
Terms: cost incurrence
Objective: 2
AACSB: Analytical skills

Answer the following questions using the information below:

Caruso Cool manufactures single room sized air conditioners. The cost accounting system estimates manufacturing costs to be $190 per air conditioner, consisting of 75% variable costs and 25% fixed costs. The company has surplus capacity available. It is Caruso Cool's policy to add a 30% markup to full costs.

7) Caruso is invited to bid on a one-time-only special order to supply 50 air conditioners. What is the lowest price Caruso should bid on this special order?
A) $9,500
B) $7,125
C) $12,500
D) $12,350

Answer: B
Explanation: B) $190 × 75% × 50 air conditioners = $7,125
Diff: 2
Terms: cost incurrence
Objective: 2
AACSB: Analytical skills
8) A medium sized motel chain is currently expanding and has decided to create more rooms and air condition all of its rooms, which are currently not air conditioned. Caruso Cool is invited to submit a bid to the motel chain. What per unit price will Caruso Cool MOST likely bid for this special order of 50 units?
A) $190.00 per unit  
B) $142.50 per unit  
C) $247.00 per unit  
D) $250.00 per unit  
Answer: C  
Explanation: C) $190 + ($190 × 30%) = $247  
Diff: 2  
Terms: cost incurrence  
Objective: 2  
AACSB: Analytical skills

Answer the following questions using the information below:

Rogers' Heaters is approached by Ms. Sushi, a new customer, to fulfill a large one-time-only special order for a product similar to one offered to regular customers. Rogers' Heaters has excess capacity. The following per unit data apply for sales to regular customers:

<table>
<thead>
<tr>
<th>Direct materials</th>
<th>$400</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct manufacturing labor</td>
<td>120</td>
</tr>
<tr>
<td>Variable manufacturing support</td>
<td>60</td>
</tr>
<tr>
<td>Fixed manufacturing support</td>
<td>200</td>
</tr>
<tr>
<td>Total manufacturing costs</td>
<td>780</td>
</tr>
<tr>
<td>Markup (30%)</td>
<td>234</td>
</tr>
<tr>
<td>Estimated selling price</td>
<td>$1,014</td>
</tr>
</tbody>
</table>

9) For Rogers' Heaters, what is the minimum acceptable price of this one-time-only special order?
A) $580  
B) $780  
C) $520  
D) $1,014  
Answer: A  
Explanation: A) $400 + $120 + $60 = $580  
Diff: 2  
Terms: target price  
Objective: 2  
AACSB: Analytical skills
10) Before accepting this one-time-only special order, Rogers’ Heaters should consider the impact on:
A) current plant capacity
B) long-term customers
C) competitors
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: target price
Objective: 2
AACSB: Analytical skills

Answer the following questions using the information below:

Gerry's Generator Supply is approached by Mr. Sandman, a new customer, to fulfill a large one-time-only special order for a product similar to one offered to regular customers. Gerry's Generator Supply has excess capacity. The following per unit data apply for sales to regular customers:

<table>
<thead>
<tr>
<th>Direct materials</th>
<th>$1,700.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct manufacturing labor</td>
<td>100.00</td>
</tr>
<tr>
<td>Variable manufacturing support</td>
<td>200.00</td>
</tr>
<tr>
<td>Fixed manufacturing support</td>
<td>150.00</td>
</tr>
<tr>
<td>Total manufacturing costs</td>
<td>$2,150.00</td>
</tr>
<tr>
<td>Markup (20%)</td>
<td>430.00</td>
</tr>
<tr>
<td>Estimated selling price</td>
<td>$2,580.00</td>
</tr>
</tbody>
</table>

11) For Gerry's Generators, what is the minimum acceptable price of this one-time-only special order?
A) $1,800
B) $2,000
C) $2,150
D) $2,580
Answer: B
Explanation: B) $1,700 + $100 + $200 = $2,000
Diff: 2
Terms: target price
Objective: 2
AACSB: Analytical skills

12) Before accepting this one-time-only special order, Gerry's Generators wants to know how much profit would be made on the order:
A) $2,000
B) Loss of $150
C) $0
D) $430
Answer: C
Diff: 2
Terms: target price
Objective: 2
AACSB: Analytical skills
Marcia Manufacturing is approached by a European customer to fulfill a one-time-only special order for a product similar to one offered to domestic customers. Marcia Manufacturing has a policy of adding a 20% markup to full costs and currently has excess capacity. The following per unit data apply for sales to regular customers:

\[
\begin{align*}
\text{Variable costs:} & \\
\text{Direct materials} & \quad $30 \\
\text{Direct labor} & \quad 10 \\
\text{Manufacturing overhead} & \quad 15 \\
\text{Marketing costs} & \quad 5 \\
\hline
\text{Fixed costs:} & \\
\text{Manufacturing overhead} & \quad 100 \\
\text{Marketing costs} & \quad 20 \\
\hline
\text{Total costs} & \quad 180 \\
\text{Markup (10\%)} & \quad 36 \\
\text{Estimated selling price} & \quad $216
\end{align*}
\]

13) For Marcia Manufacturing, what is the minimum acceptable price of this one-time-only special order?
A) $40  
B) $55  
C) $60  
D) $66  
Answer: C
Explanation:  C) $30 + $10 + $15 + $5 = $60  
Diff: 2  
Terms: cost-plus pricing  
Objective: 2  
AACSB: Multiculturalism and diversity

14) What is the full cost of the product per unit?
A) $60  
B) $180  
C) $198  
D) $66  
Answer: B
Explanation:  B) $30 + $10 + $15 + $5 + $100 + $20 = $180  
Diff: 1  
Terms: cost-plus pricing  
Objective: 2  
AACSB: Analytical skills
Answer the following questions using the information below:

Ferryman Products manufactures coffee tables. Ferryman Products has a policy of adding a 20% markup to full costs and currently has excess capacity. The following information pertains to the company’s normal operations per month:

- Output units: 30,000 tables
- Machine-hours: 8,000 hours
- Direct manufacturing labor-hours: 10,000 hours
- Direct materials per unit: $100
- Direct manufacturing labor per hour: $12
- Variable manufacturing overhead costs: $322,500
- Fixed manufacturing overhead costs: $1,200,000
- Product and process design costs: $900,000
- Marketing and distribution costs: $1,125,000

15) Ferryman Products is approached by an overseas customer to fulfill a one-time-only special order for 1,000 units. All cost relationships remain the same except for a one-time setup charge of $20,000. No additional design, marketing, or distribution costs will be incurred. What is the minimum acceptable bid per unit on this one-time-only special order?
   A) $134.75
   B) $154.76
   C) $222.25
   D) $161.70

   Answer: A
   Explanation:
   A) Direct materials ($100 x 1,000) $100,000
   Direct manufacturing labor $12 x (10,000 / 30,000) x 1,000 4,000
   Variable manufacturing ($322,500 / 30,000 x 1,000) 10,750
   Setup (one time charge $20,000) 20,000
   Minimum acceptable bid $134,750
   $134,750/1,000 = 134.75

   Diff: 3
   Terms: cost-plus pricing
   Objective: 2
   AACSB: Analytical skills
Answer the following questions using the information below:

Delgreco Products manufactures high-tech cell phones. Delgreco Products has a policy of adding a 30% markup to full costs and currently has excess capacity. The following information pertains to the company's normal operations per month:

<table>
<thead>
<tr>
<th>Output units</th>
<th>10,000 phones</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine-hours</td>
<td>8,000 hours</td>
</tr>
<tr>
<td>Direct manufacturing labor-hours</td>
<td>5,000 hours</td>
</tr>
<tr>
<td>Direct materials per unit</td>
<td>$25</td>
</tr>
<tr>
<td>Direct manufacturing labor per hour</td>
<td>$15</td>
</tr>
<tr>
<td>Variable manufacturing overhead costs</td>
<td>$175,000</td>
</tr>
<tr>
<td>Fixed manufacturing overhead costs</td>
<td>$425,000</td>
</tr>
<tr>
<td>Product and process design costs</td>
<td>$400,000</td>
</tr>
<tr>
<td>Marketing and distribution costs</td>
<td>$475,000</td>
</tr>
</tbody>
</table>

16) Delgreco Products is approached by an overseas customer to fulfill a one-time-only special order for 1,000 units. All cost relationships remain the same except for a one-time setup charge of $15,000. No additional design, marketing, or distribution costs will be incurred. What is the minimum acceptable bid per unit on this one-time-only special order?

A) $180.00  
B) $92.50  
C) $65.00  
D) $234.00  
Answer:  C  
Explanation:  
C) Direct materials $25.00  
Direct manufacturing labor (5,000/10,000) × $15  7.50  
Variable manufacturing ($175,000/10,000)  17.50  
Setup ($15,000/1000)  15.00  
Minimum acceptable bid $65.00  
Diff: 3  
Terms: cost-plus pricing  
Objective:  2  
AACSB: Analytical skills

17) A short-run pricing decision typically has a time horizon of less than:

A) one year  
B) two years  
C) five years  
D) None of these answers is correct.  
Answer:  A  
Diff: 1  
Terms: target price  
Objective:  2  
AACSB: Reflective thinking
18) Short-run pricing decisions include adjusting product mix in a competitive environment.
Answer: TRUE
Diff: 2
Terms: target price
Objective: 2
AACSB: Reflective thinking

19) Profit margins are often set to earn a reasonable return on investment for short-term pricing decisions, but NOT long-term pricing decisions.
Answer: FALSE
Explanation: Profit margins are often set to earn a reasonable return on investment for long-term pricing decisions, but not short-term pricing decision.
Diff: 2
Terms: target operating income per unit
Objective: 2
AACSB: Reflective thinking

20) In a one-time-only special order, variable manufacturing costs are irrelevant.
Answer: FALSE
Explanation: In a one-time-only special order, existing fixed manufacturing costs are irrelevant.
Diff: 2
Terms: value-added cost
Objective: 2
AACSB: Reflective thinking

21) Backwoods Incorporated manufactures rustic furniture. The cost accounting system estimates manufacturing costs to be $80 per table, consisting of 70% variable costs and 30% fixed costs. The company has surplus capacity available. It is Backwoods' policy to add a 50% markup to full costs.

a. Backwoods Incorporated is invited to bid on an order to supply 100 rustic tables. What is the lowest price Backwoods should bid on this one-time-only special order?

b. A large hotel chain is currently expanding and has decided to decorate all new hotels using the rustic style. Backwoods Incorporated is invited to submit a bid to the hotel chain. What is the lowest price per unit Backwoods should bid on this long-term order?

Answer:
a. The lowest price Backwoods should bid on the 100 table one-time special order is $5,600 = Variable costs ($80 \times .70 \times 100 tables), the short-term incremental costs.

b. The lowest price Backwoods should bid on the long-term hotel chain order is $120 per table = Full costs $80 + 50% markup, the long-term targeted price.

Diff: 2
Terms: cost-plus pricing
Objective: 2
AACSB: Analytical skills
Objective 12.3

1) Long-run pricing decisions:
   A) have a time horizon of less than one year
   B) include adjusting product mix in a competitive environment
   C) and short-run pricing decisions generally have the same relevant costs
   D) use prices that include a reasonable return on investment
   Answer: D
   Diff: 3
   Terms: target rate of return on investment
   Objective: 3
   AACSB: Reflective thinking

2) Long-run pricing:
   A) needs to cover only incremental costs
   B) only utilizes the market-based approach to pricing and not the cost-based approach
   C) is a strategic decision
   D) strives for flexible pricing that can respond to temporary changes in demand
   Answer: C
   Diff: 2
   Terms: target price
   Objective: 3
   AACSB: Reflective thinking

3) For long-run pricing decisions, using stable prices has the advantage of:
   A) minimizing the need to monitor competitor's prices frequently
   B) reducing the need to change cost structures frequently
   C) reducing competition
   D) helping to build buyer-seller relationships
   Answer: D
   Diff: 2
   Terms: target price
   Objective: 3
   AACSB: Reflective thinking
Answer the following questions using the information below:

Black Forrest manufactures rustic furniture. The cost accounting system estimates manufacturing costs to be $240 per table, consisting of 60% variable costs and 40% fixed costs. The company has surplus capacity available. It is Black Forrest policy to add a 50% markup to full costs.

4) A large hotel chain is currently expanding and has decided to decorate all new hotels using the rustic style. Black Forrest is invited to submit a bid to the hotel chain. What per unit price will Black Forrest most likely bid on this long-term order?
   A) $144 per unit
   B) $216 per unit
   C) $360 per unit
   D) $240 per unit

   Answer: C
   Explanation: C) $240 + ($240 × 50%) = $360
   Diff: 2
   Terms: cost incurrence
   Objective: 3
   AACSB: Analytical skills

Answer the following questions using the information below:

Rogers' Heaters is approached by Ms. Sushi, a new customer, to fulfill a large one-time-only special order for a product similar to one offered to regular customers. Rogers' Heaters has excess capacity. The following per unit data apply for sales to regular customers:

| Direct materials | $400 |
| Direct manufacturing labor | 120 |
| Variable manufacturing support | 60 |
| Fixed manufacturing support | 200 |
| Total manufacturing costs | 780 |
| Markup (30%) | 234 |
| Estimated selling price | $1,014 |

5) If Ms. Sushi wanted a long-term commitment for supplying this product, what price would most likely be quoted to her?
   A) $580
   B) $780
   C) $520
   D) $1,014

   Answer: D
   Explanation: D) The estimated selling price of $1,014.
   Diff: 2
   Terms: cost-plus pricing
   Objective: 3
   AACSB: Analytical skills
Answer the following questions using the information below:

Gerry's Generator Supply is approached by Mr. Sandman, a new customer, to fulfill a large one-time-only special order for a product similar to one offered to regular customers. Gerry's Generator Supply has excess capacity. The following per unit data apply for sales to regular customers:

<table>
<thead>
<tr>
<th>Cost Component</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$1,700.00</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>100.00</td>
</tr>
<tr>
<td>Variable manufacturing support</td>
<td>200.00</td>
</tr>
<tr>
<td>Fixed manufacturing support</td>
<td>150.00</td>
</tr>
<tr>
<td><strong>Total manufacturing costs</strong></td>
<td><strong>2,150.00</strong></td>
</tr>
<tr>
<td>Markup (20%)</td>
<td>430.00</td>
</tr>
<tr>
<td><strong>Estimated selling price</strong></td>
<td><strong>$2,580.00</strong></td>
</tr>
</tbody>
</table>

6) If Mr. Sandman wanted a long-term commitment for supplying this product, what price would most likely be quoted to him?
A) $2,000
B) $2,150
C) $2,580
D) $2,800

Answer: C
Explanation: C) The estimated selling price of $2,580

Diff: 2
Terms: cost-plus pricing
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

Marcia Manufacturing is approached by a European customer to fulfill a one-time-only special order for a product similar to one offered to domestic customers. Marcia Manufacturing has a policy of adding a 20% markup to full costs and currently has excess capacity. The following per unit data apply for sales to regular customers:

\[
\begin{align*}
\text{Variable costs:} & \\
\text{Direct materials} & \text{ } \$30 \\
\text{Direct labor} & \text{ } 10 \\
\text{Manufacturing overhead} & \text{ } 15 \\
\text{Marketing costs} & \text{ } 5 \\
\hline 
\text{Fixed costs:} & \\
\text{Manufacturing overhead} & \text{ } 100 \\
\text{Marketing costs} & \text{ } 20 \\
\hline 
\text{Total costs} & \text{ } 180 \\
\text{Markup (10\%)} & \text{ } 36 \\
\text{Estimated selling price} & \text{ } \$216
\end{align*}
\]

7) If the European customer wanted a long-term commitment for supplying this product, what price would most likely be quoted?
A) $66.00
B) $180.00
C) $216.00
D) $236.00

Answer: C
Explanation: C) The estimated selling price of $216.

Diff: 2
Terms: cost-plus pricing
Objective: 3
AACSB: Multiculturalism and diversity
Answer the following questions using the information below:

Ferryman Products manufactures coffee tables. Ferryman Products has a policy of adding a 20% markup to full costs and currently has excess capacity. The following information pertains to the company's normal operations per month:

<table>
<thead>
<tr>
<th>Output units</th>
<th>30,000  tables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine-hours</td>
<td>8,000  hours</td>
</tr>
<tr>
<td>Direct manufacturing labor-hours</td>
<td>10,000  hours</td>
</tr>
</tbody>
</table>

| Direct materials per unit | $100 |
| Direct manufacturing labor per hour | $12 |
| Variable manufacturing overhead costs | $322,500 |
| Fixed manufacturing overhead costs | $1,200,000 |
| Product and process design costs | $900,000 |
| Marketing and distribution costs | $1,125,000 |

8) For long-run pricing of the coffee tables, what price will most likely be used by Berryman?

A) $134.76  
B) $161.70  
C) $222.25  
D) $266.70  

Answer:  D  
Explanation:  
D) Direct materials $100 x 1,000  
Direct manufacturing labor $12 x 10,000/30,000 x 1,000  
Variable manufacturing ($322,500/30,000) x 1,000  
Fixed manufacturing ($1,200,000/30,000) x 1,000  
Product and process design costs ($900,000/30,000) x 1,000  
Marketing and distribution ($1,250,000/30,000) x 1,000  
Full cost per unit  
Markup (20%)  
Estimated selling price  

Diff: 3  
Terms: cost-plus pricing  
Objective:  3  
AACSB: Analytical skills
Answer the following questions using the information below:

Delgreco Products manufactures high-tech cell phones. Delgreco Products has a policy of adding a 30% markup to full costs and currently has excess capacity. The following information pertains to the company's normal operations per month:

- Output units: 10,000 phones
- Machine-hours: 8,000 hours
- Direct manufacturing labor-hours: 5,000 hours
- Direct materials per unit: $25
- Direct manufacturing labor per hour: $15
- Variable manufacturing overhead costs: $175,000
- Fixed manufacturing overhead costs: $425,000
- Product and process design costs: $400,000
- Marketing and distribution costs: $475,000

9) For long-run pricing of the cell phones, what price will MOST likely be used by Delgreco?

A) $180.00
B) $92.50
C) $65.00
D) $234.00

Answer: D

Explanation:  
- Direct materials $25.00
- Direct manufacturing labor ($15 × 5,000)/10,000 = 7.50
- Variable manufacturing ($175,000/10,000) = 17.50
- Fixed manufacturing ($425,000/10,000) = 42.50
- Product and process design costs ($400,000/10,000) = 40.00
- Marketing and distribution ($475,000/10,000) = 47.50

Full cost per unit = $180.00
Markup (30%) = $54.00
Estimated selling price = $234.00

Diff: 3
Terms: cost-plus pricing
Objective: 3
AACSB: Analytical skills

10) Which one of the following activities would most likely be considered a long-run pricing decision?

A) one-time-only special order pricing
B) product mix adjustments in a competitive market
C) setting prices to generate a reasonable rate of return on investment
D) changing prices in response to weak demand

Answer: C

Diff: 2
Terms: target price
Objective: 3
AACSB: Analytical skills
11) Relevant costs of a bidding decision should EXCLUDE revenues lost on lower-priced sales to existing customers.
Answer: FALSE
Explanation: Relevant costs of a bidding decision should include revenues lost on lower-priced sales to existing customers.
Diff: 3
Terms: value-added cost
Objective: 3
AACSB: Reflective thinking

12) Customers prefer stable and predictable prices over a long time horizon.
Answer: TRUE
Diff: 2
Terms: target price
Objective: 3
AACSB: Reflective thinking

13) Product cost analysis is important even if market forces set prices.
Answer: TRUE
Diff: 3
Terms: cost incurrence
Objective: 3
AACSB: Reflective thinking

14) Two different approaches to pricing decisions are market based and cost based.
Answer: TRUE
Diff: 3
Terms: target price
Objective: 3
AACSB: Reflective thinking

15) Companies that operate in non competitive environments offering products or services that differ from each other use a market-based approach when making their long-run pricing decisions.
Answer: FALSE
Explanation: Companies that are not competitive favor cost-based approaches because they do not need to respond or react to competitor's prices. The margin they add to the costs to determine the price depends on the value the customers place on the product or service.
Diff: 3
Terms: target price
Objective: 3
AACSB: Reflective thinking
16) Companies that operate in non competitive environments offering products or services that differ from each other can charge a very high price for their products and services.

Answer: FALSE

Explanation: Although they do not have to respond to competition of other companies, the price they can set depends on the value the customers place on the product or service.

Diff: 3

Terms: target price

Objective: 3

AACSB: Reflective thinking

17) Schlickau Company manufactures basketball backboards. The following information pertains to the company's normal operations per month:

| Output units | 15,000 boards |
| Machine-hours | 4,000 hours |
| Direct manufacturing labor-hours | 5,000 hours |
| Direct manufacturing labor per hour | $12 |
| Direct materials per unit | $100 |
| Variable manufacturing overhead costs | $150,000 |
| Fixed manufacturing overhead costs | $300,000 |
| Product and process design costs | $200,000 |
| Marketing and distribution costs | $250,000 |

Required:

a. For long-run pricing, what is the full-cost base per unit?

b. Schlickau Company is approached by an overseas city to fulfill a one-time-only special order for 1,000 units. All cost relationships remain the same except for an additional one-time setup charge of $40,000. No additional design, marketing, or distribution costs will be incurred. What is the minimum acceptable bid per unit on this one-time-only special order?

Answer:

a. Direct materials $100.00
   Direct manufacturing labor ($12 × 5,000)/15,000 4.00
   Variable manufacturing ($150,000/15,000) 10.00
   Fixed manufacturing ($300,000/15,000) 20.00
   Marketing and distribution ($250,000/15,000) 16.67
   Research and development ($200,000/15,000) 13.33
   Total $164.00

b. Direct materials $100.00
   Direct manufacturing labor 4.00
   Variable manufacturing 10.00
   Setup ($40,000 / 1,000) 40.00
   Total $154.00

Diff: 2

Terms: cost-plus pricing

Objective: 2, 3

AACSB: Analytical skills
18) Explain the differences between short-run pricing decisions and long-run pricing decisions.
Answer: Short-run pricing decisions typically have a time horizon of less than a year and include such
decisions such as (a) pricing a one-time-only special order with no long-run implications and (b)
adjusting product mix and output volume in a competitive market place. Two key differences affect
pricing for the long-run versus the short-run.
1. Fixed costs are often irrelevant for the short-run and are generally relevant in the long-run because
they can be altered in the long-run.
2. Profit Margins in the long-run pricing decisions are often set to earn a reasonable return on
investment. Short-run pricing decisions is more opportunistic. Prices are decreased when demand is
weak and increased when demand is strong.
Diff: 2
Terms: life-cycle budgeting
Objective: 2, 3
AACSB: Reflective thinking

Objective 12.4

1) Target pricing:
A) is used for short-term pricing decisions
B) is one form of cost-based pricing
C) estimates are based on customers' perceived value of the product
D) relevant costs are all variable costs
Answer: C
Diff: 3
Terms: target price
Objective: 4
AACSB: Reflective thinking

2) To understand how competitors might price competing products, a company:
A) needs to understand the competitor's technologies and financial conditions
B) may get information from suppliers that service the competitor
C) may use reverse engineering
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: target price
Objective: 4
AACSB: Reflective thinking

3) The department usually in the best position to identify customers' needs is the:
A) production department
B) sales and marketing department
C) design department
D) distribution department
Answer: B
Diff: 1
Terms: target price
Objective: 4
AACSB: Reflective thinking
4) Relevant costs for target pricing are:
   A) variable manufacturing costs
   B) variable manufacturing and variable nonmanufacturing costs
   C) all fixed costs
   D) all future costs, both variable and fixed
   Answer: D
   Diff: 2
   Terms: target price, target cost per unit
   Objective: 4
   AACSB: Reflective thinking

5) Place the following steps for the implementation of target costing in order:
   A = Derive a target cost
   B = Develop a target price
   C = Perform value engineering
   D = Determine target operating income
   A) B D A C
   B) B A D C
   C) A D B C
   D) A B C D
   Answer: A
   Diff: 2
   Terms: target cost per unit, target price, target operating income per unit
   Objective: 4
   AACSB: Reflective thinking

6) Value engineering may result in all of the following EXCEPT:
   A) improved product design
   B) changes in materials specifications
   C) increases in the quantity of nonvalue-added cost drivers
   D) the evaluation of all business functions within the value chain
   Answer: C
   Diff: 3
   Terms: value engineering
   Objective: 4
   AACSB: Reflective thinking

7) Value-added costs:
   A) are costs that a customer is unwilling to pay for
   B) include maintenance and repairs of the manufacturing equipment
   C) are reduced through improved efficiencies
   D) if eliminated, increase profitability
   Answer: C
   Diff: 2
   Terms: value-added cost
   Objective: 4
   AACSB: Reflective thinking
8) To design costs out of products is a goal of:
A) cost-plus pricing
B) target costing
C) kaizen costing
D) peak-load costing
Answer: B
Diff: 1
Terms: designed-in costs
Objective: 4
AACSB: Reflective thinking

9) All of the following are true regarding target costing EXCEPT:
A) improvements are implemented in small incremental amounts
B) customer input is essential to the target costing process
C) input is requested from suppliers and distributors
D) a key goal is to minimize costs over the product's useful life
Answer: A
Diff: 3
Terms: target cost per unit
Objective: 4
AACSB: Reflective thinking

10) All of the following are associated with target costing EXCEPT:
A) value engineering
B) the markup component
C) all value-chain business functions
D) cross-functional teams
Answer: B
Diff: 2
Terms: target cost per unit, target price, target operating income per unit
Objective: 4
AACSB: Reflective thinking

11) When target costing and target pricing are used together:
A) the target cost is established first, then the target price
B) the target cost is the estimated long-run cost that enables a product or service to achieve a desired profit
C) the focus of target pricing is to undercut the competition
D) target costs are generally higher than current costs
Answer: B
Diff: 3
Terms: target cost per unit, target price
Objective: 4
AACSB: Reflective thinking
12) The product strategy in which companies first determine the price at which they can sell a new product and then design a product that can be produced at a low enough cost to provide adequate operating income is referred to as:
A) cost-plus pricing
B) target costing
C) kaizen costing
D) full costing
Answer: B
Diff: 1
Terms: target price, target cost per unit
Objective: 4
AACSB: Reflective thinking

Answer the following questions using the information below:

After conducting a market research study, Ed Manufacturing decided to produce a new interior door to complement its exterior door line. It is estimated that the new interior door can be sold at a target price of $120. The annual target sales volume for interior doors is 20,000. Ed has target operating income of 20% of sales.

13) What are target sales revenues?
A) $1,920,000
B) $4,000,000
C) $2,400,000
D) None of these answers is correct.
Answer: C
Explanation: C) $120 \times 20,000 = $2,400,000
Diff: 1
Terms: target price
Objective: 4
AACSB: Analytical skills

14) What is the target operating income?
A) $480,000
B) $600,000
C) $384,000
D) $360,000
Answer: A
Explanation: A) $2,400,000 \times 20\% = $480,000
Diff: 2
Terms: target operating income per unit
Objective: 4
AACSB: Analytical skills
15) What is the target cost?
A) $1,800,000
B) $1,920,000
C) $2,520,000
D) $2,016,000
Answer: B
Explanation: B) $2,400,000 - ($2,400,000 × 20%) = $1,920,000
Diff: 2
Terms: target cost per unit
Objective: 4
AACSB: Analytical skills

16) What is the target cost for each interior door?
A) $96
B) $116
C) $120
D) $90
Answer: A
Explanation: A) \([\frac{$2,400,000 - ($2,400,000 \times 20\%)}{20,000}] = $96\]
Diff: 2
Terms: target cost per unit
Objective: 4
AACSB: Analytical skills

Answer the following questions using the information below:

After conducting a market research study, Harry Products decided to produce an electric coffee pot to complement its line of kitchen products. It is estimated that the new coffee pot can be sold at a target price of $23. The annual target sales volume for the coffee pot is 300,000. Potter has target operating income of 18% of sales.

17) What are the target sales revenues?
A) $690,000
B) $6,900,000
C) $600,000
D) $6,000,000
Answer: B
Explanation: B) $23 \times 300,000 = $6,900,000
Diff: 1
Terms: target price
Objective: 4
AACSB: Analytical skills
18) What is the target operating income?
A) $1,200,000
B) $600,000
C) $621,000
D) $1,242,000
Answer: D
Explanation: D) $23 \times 300,000 \times 18\% = $1,242,000
Diff: 2
Terms: target operating income per unit
Objective: 4
AACSB: Analytical skills

19) What is the total target cost?
A) $1,242,000
B) $5,658,000
C) $6,900,000
D) $500,000
Answer: B
Explanation: B) $23 \times 300,000 \times (1 - .18) = $5,658,000
Diff: 2
Terms: target cost per unit
Objective: 4
AACSB: Analytical skills

20) What is the target cost for each coffee pot?
A) $17.75
B) $18.86
C) $21.08
D) $23.00
Answer: B
Explanation: B) $23 \times (1 - .18) = $18.86
Diff: 2
Terms: target cost per unit
Objective: 4
AACSB: Analytical skills
Answer the following questions using the information below:

Block Island TV currently sells large televisions for $360. It has costs of $280. A competitor is bringing a new large television to market that will sell for $300. Management believes it must lower the price to $300 to compete in the market for large televisions. Marketing believes that the new price will cause sales to increase by 10%, even with a new competitor in the market. Block Island TV sales are currently 100,000 televisions per year.

21) What is the target cost if target operating income is 25% of sales?
   A) $75
   B) $90
   C) $225
   D) $270
   Answer:  C
   Explanation:  C) $300 - ($300 × 0.25) = $225
   Diff: 2
   Terms:  target cost per unit, target operating income per unit, target price
   Objective:  4
   AACSB:  Analytical skills

22) What is the change in operating income if marketing is correct and only the sales price is changed?
   A) $2,200,000
   B) $600,000
   C) $2,200,000
   D) $(5,800,000)
   Answer:  D
   Explanation:  D) [100,000 × ($360 - $280)] - [110,000 × ($300 - $280)] = $(5,800,000)
   Diff: 3
   Terms:  target price, target operating income per unit
   Objective:  4
   AACSB:  Analytical skills

23) What is the target cost if the company wants to maintain its same income level, and marketing is correct (rounded to the nearest cent)?
   A) $225.00
   B) $227.27
   C) $246.68
   D) $280.00
   Answer:  B
   Explanation:  B) Current income = 100,000 × ($360 - $280) = $8,000,000
   Target cost y: $8,000,000 = (110,000 × $300) - 110,000y
   y = $25,000,000/110,000 = $227.27
   Diff: 3
   Terms:  target price, target cost per unit, target operating income per unit
   Objective:  4
   AACSB:  Analytical skills
Frank's Computer Monitors, Inc., currently sells 17" monitors for $270. It has costs of $210. A competitor is bringing a new 17" monitor to market that will sell for $225. Management believes it must lower the price to $225 to compete in the market for 17" monitors. Marketing believes that the new price will cause sales to increase by 10%, even with a new competitor in the market. Frank's sales are currently 10,000 monitors per year.

24) What is the target cost if operating income is 25% of sales?
A) $56.25
B) $67.50
C) $168.75
D) $202.50
Answer: C
Explanation: C) $225 - ($225 × 0.25) = $168.75
Diff: 2
Terms: target price, target cost per unit, target operating income per unit
Objective: 4
AACSB: Analytical skills

25) What is the change in operating income if marketing is correct and only the sales price is changed?
A) $165,000
B) $45,000
C) $(165,000)
D) $(435,000)
Answer: D
Explanation: D) [10,000 × ($270 - $210)] - [11,000 × ($225 - $210)] = $(435,000)
Diff: 3
Terms: target price, target cost per unit, target operating income per unit
Objective: 4
AACSB: Analytical skills

26) What is the target cost if the company wants to maintain its same income level, and marketing is correct (rounded to the nearest cent)?
A) $168.75
B) $170.46
C) $185.00
D) $210.00
Answer: B
Explanation: B) Current income = 10,000 × ($270 - $210) = $600,000
Target cost y: $600,000 = (11,000 × $225) - 11,000y
y = $1,875,000/11,000 = $170.4545
Diff: 3
Terms: target price, target cost per unit, target operating income per unit
Objective: 4
AACSB: Analytical skills
27) When the firm uses the target-costing approach to pricing, the target cost per unit is the difference between the per unit target price and the per unit target:
   A) contribution margin
   B) operating income
   C) production costs
   D) gross margin
   Answer: B
   Diff: 2
   Terms: target price
   Objective: 4
   AACSB: Reflective thinking

28) Action Toys has a new video game cassette for the upcoming holiday season. It is trying to determine the target cost for the game if the selling price per unit will be set at $60, the going price for video games, and the firm wants to earn a target operating income of 12% of sales. What will be the target cost per unit for the new game?
   A) $48.00
   B) $52.80
   C) $53.57
   D) $67.20
   Answer: B
   Explanation: B) target operating income $60 \times .12 = $7.20; target cost = $60 - $7.20 = $52.80
   Diff: 2
   Terms: target cost per unit
   Objective: 4
   AACSB: Analytical skills

29) Target pricing is a form of cost-based pricing.
   Answer: FALSE
   Explanation: Target pricing is a form of market-based pricing.
   Diff: 1
   Terms: target price
   Objective: 4
   AACSB: Reflective thinking

30) The first step in target pricing is to determine the target cost of the product.
   Answer: FALSE
   Explanation: The first step in target pricing is to determine the target price of the product.
   Diff: 1
   Terms: target cost per unit, target price
   Objective: 4
   AACSB: Reflective thinking
31) Value engineering has the objective of increasing costs while still satisfying customer needs.
Answer: FALSE
Explanation: Value engineering has the objective of reducing costs while still satisfying customer needs.
Diff: 1
Terms: value engineering
Objective: 4
AACSB: Reflective thinking

32) Reverse engineering has the objective of reducing costs while still satisfying customer needs.
Answer: FALSE
Explanation: Value engineering has the objective of reducing costs while still satisfying customer needs. Reverse engineering is a means of obtaining information about a company's competitors by disassembling and analyzing the competitor products to determine the design, materials, and technology used.
Diff: 1
Terms: value engineering
Objective: 4
AACSB: Reflective thinking

33) Rework is an example of a value-added cost.
Answer: FALSE
Explanation: Rework is an example of a non-value-added cost.
Diff: 1
Terms: non-value-added costs
Objective: 4
AACSB: Reflective thinking

34) A value-added cost is a cost that, if eliminated, would increase the actual or perceived value or utility (usefulness) customers experience from using the product or service.
Answer: FALSE
Explanation: A value-added cost is a cost that, if eliminated, would reduce the actual or perceived value or utility (usefulness) customers experience from using the product or service.
Diff: 2
Terms: non-value-added costs, value-added cost
Objective: 4
AACSB: Reflective thinking

35) Value engineering seeks to reduce value-added costs as well as non-value-added costs.
Answer: TRUE
Diff: 3
Terms: value engineering
Objective: 4
AACSB: Reflective thinking
36) A target price is the estimated price for a product or service that potential customers are willing to pay.
Answer: TRUE
Diff: 2
Terms: target price
Objective: 4
AACSB: Reflective thinking

37) Target costing begins with the price the customer is willing to pay and the "backs-into" what the product should cost.
Answer: TRUE
Diff: 2
Terms: target cost per unit
Objective: 4
AACSB: Reflective thinking

38) Cost-plus pricing starts with what customers are willing to pay, and then adds a desired profit.
Answer: FALSE
Explanation: Cost-plus pricing starts with what the product costs, and then adds a desired mark-up on the cost.
Diff: 2
Terms: cost-plus pricing
Objective: 4
AACSB: Reflective thinking

39) Value engineering can be used to make cost improvements to meet a target cost.
Answer: TRUE
Diff: 2
Terms: value engineering
Objective: 4
AACSB: Reflective thinking

40) Whether the firm uses the market-based approach or the cost-based approach for pricing decisions, the market forces must be considered.
Answer: TRUE
Diff: 2
Terms: target price
Objective: 4
AACSB: Reflective thinking

41) One goal of target costing is to keep costs below the target price.
Answer: TRUE
Diff: 2
Terms: target price, target cost per unit
Objective: 4
AACSB: Reflective thinking
42) Steven Corporation manufactures fishing poles that have a price of $42.00. It has costs of $32.64 A competitor is introducing a new fishing pole that will sell for $36.00. Management believes it must lower the price to $36.00 to compete in the highly cost-conscious fishing pole market. Marketing believes that the new price will maintain the current sales level. Steven Corporation's sales are currently 200,000 poles per year.

**Required:**

a. What is the target cost for the new price if target operating income is 20% of sales?

b. What is the change in operating income for the year if $18.00 is the new price and costs remain the same?

c. What is the target cost per unit if the selling price is reduced to $36.00 and the company wants to maintain its same income level?

Answer:

a. $36.00 - ($36.00 × 0.20) = $28.80

b. Change = 200,000 × ($42.00 - $32.64) - [200,000 × ($36.00 - $32.64)]
   = $1,872,000 - $672,000
   = $1,200,000 reduction in income

c. Current income = 200,000 × ($42.00 - $32.64) = $1,872,000

Target cost per unit:

\[ \$1,872,000 = (200,000 \times \$36.00) - 200,000y \]
\[ 200,000y = \$5,328,000 \]
\[ y = \$26.64 \]

Diff: 2

Terms: target cost per unit, target price, target operating income per unit

Objective: 4

AACSB: Analytical skills
43) Robert's Medical Equipment Company manufactures hospital beds. Its most popular model, Deluxe, sells for $5,000. It has variable costs totaling $2,800 and fixed costs of $1,000 per unit, based on an average production run of 5,000 units. It normally has four production runs a year, with $400,000 in setup costs each time. Plant capacity can handle up to six runs a year for a total of 30,000 beds.

A competitor is introducing a new hospital bed similar to Deluxe that will sell for $4,000. Management believes it must lower the price to compete. Marketing believes that the new price will increase sales by 25% a year. The plant manager thinks that production can increase by 25% with the same level of fixed costs. The company currently sells all the Deluxe beds it can produce.

**Required:**

a. What is the annual operating income from Deluxe at the current price of $5,000?
b. What is the annual operating income from Deluxe if the price is reduced to $4,000 and sales in units increase by 25%?
c. What is the target cost per unit for the new price if target operating income is 20% of sales?

**Answer:**

a. Sales (20,000 × $5,000) $100,000,000

Costs:

<table>
<thead>
<tr>
<th>Costs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable costs (20,000 × $2,800)</td>
<td>$56,000,000</td>
</tr>
<tr>
<td>Fixed costs ($1,000 × 5,000 × 4)</td>
<td>20,000,000</td>
</tr>
<tr>
<td>Setup costs ($400,000 × 4)</td>
<td>1,600,000</td>
</tr>
</tbody>
</table>

Operating income $ 22,400,000

b. Sales (25,000 × $4,000) $100,000,000

Costs:

<table>
<thead>
<tr>
<th>Costs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable costs (25,000 × $2,800)</td>
<td>$70,000,000</td>
</tr>
<tr>
<td>Fixed costs, same</td>
<td>20,000,000</td>
</tr>
<tr>
<td>Setup costs ($400,000 × 5)</td>
<td>2,000,000</td>
</tr>
</tbody>
</table>

Operating income $ 8,000,000

c. $4,000 - ($4,000 × 0.20) = $3,200

Diff: 2

Terms: price elasticity, target cost per unit

Objective: 4

AACSB: Analytical skills
44) Warthog Avionics currently sells radios for $3,600. It has costs of $2,800. A competitor is bringing a new radio to market that will sell for $3,200. Management believes it must lower the price to $3,200 to compete in the market for radios. Marketing believes that the new price will cause sales to increase by 10%, even with a new competitor in the market. Warthog's sales are currently 1,000 radios per year.

**Required:**

a. What is the target cost if target operating income is 25% of sales?
b. What is the change in operating income if marketing is correct and only the sales price is changed?
c. What is the target cost if the company wants to maintain its same income level, and marketing is correct?

**Answer:**

a. $3,200 - ($3,200 × 0.25) = $2,400

b. (1,000 × ($3,600 - $2,800)) - (1,100 × ($3,200 - $2,800)) = Decrease $360,000

c. Current income = 1,000 × ($3,600 - $2,800) = $800,000
   Target cost y: $800,000 = (1,100 × $3,200) - 1,100y
   y = $2,720,000/1,100
   y = $2,472.72

  Diff: 3
  Terms: target cost per unit, target pricing
  Objective: 4
  AACSB: Analytical skills

45) Kezer Crafts currently sells motor boats for $6,000. It has costs of $4,650. A competitor is bringing a new motor boat to the market that will sell for $5,500. Management believes it must lower the price to $5,500 to compete in the market for motor boats. Marketing believes that the new price will cause sales to increase by 12.5%, even with a new competitor in the market. Kezer Crafts' sales are currently 2,000 motor boats per year.

**Required:**

a. What is the target cost if target operating income is 25% of sales?
b. What is the change in operating income if marketing is correct and only the sales price is changed?
c. What is the target cost if the company wants to maintain its same income level, and marketing is correct?

**Answer:**

a. $5,500 - ($5,500 × 0.25) = $4,125

b. (2,000 × ($6,000 - $4,650)) - (2,250 × (5,500 - $4,650)) = $787,500 less operating income

c. Current income = 2,000 × ($6,000 - $4,650) = $2,700,000
   Target cost y: $2,700,000 = (2,250 × $5,500) - 2,250y
   y = $9,675,000/2,250
   y = $4,300

  Diff: 3
  Terms: target cost per unit, target pricing
  Objective: 4
  AACSB: Analytical skills
46) In target costing, what are at least two techniques used to achieve target costing goals?
Answer: In target costing, techniques used to achieve target-costing goals include value engineering, cross-functional teams, and supply-chain management.

Diff: 2
Terms: target cost per unit, value engineering
Objective: 4
AACSB: Reflective thinking

47) What is the primary reason a firm would adopt target costing?
Answer: The primary reason a firm would adopt target costing is to reduce costs. Its unique approach is to design costs out of products during the design stage in the product life cycle. Many firms are adopting this approach when they cannot reduce costs further using traditional costing methods, which focus on cost reductions in manufacturing.

Diff: 2
Terms: target cost per unit
Objective: 4
AACSB: Reflective thinking

Objective 12.5

1) Concerns about target costing include all the following EXCEPT:
A) cross-functional teams may add too many features
B) excessive pressure is put on suppliers
C) development time may decrease
D) burnout of design engineers
Answer: C
Diff: 2
Terms: target cost per unit
Objective: 5
AACSB: Reflective thinking

2) Direct material costs are locked in when they are:
A) designed
B) assembled
C) sold
D) delivered
Answer: A
Diff: 2
Terms: locked-in costs
Objective: 5
AACSB: Reflective thinking
3) Cost accounting systems focus on when costs are:
A) incurred
B) locked in
C) paid for
D) used for setting prices for products and services
Answer: A
Diff: 1
Terms: cost incurrence
Objective: 5
AACSB: Reflective thinking

4) Most of a product's life-cycle costs are locked in by decisions made during the ________ business function of the value chain.
A) design
B) manufacturing
C) customer-service
D) marketing
Answer: A
Diff: 1
Terms: product life-cycle, life-cycle costing
Objective: 5
AACSB: Reflective thinking

5) For most products, the majority of costs are incurred during the ________ business function of the value chain.
A) design
B) manufacturing
C) customer-service
D) marketing
Answer: B
Diff: 1
Terms: cost incurrence
Objective: 5
AACSB: Reflective thinking

6) ________ focuses on reducing costs during the manufacturing stage.
A) Target costing
B) Kaizen costing
C) Cost-plus pricing
D) Life-cycle costing
Answer: B
Diff: 1
Terms: Kaizen costing
Objective: 5
AACSB: Reflective thinking
7) Cross-functional engineering teams may include:
A) marketing managers
B) suppliers
C) management accountants
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: cost incurrence
Objective: 5
AACSB: Reflective thinking

8) In some industries, such as legal and consulting, most costs are locked in:
A) when they are incurred
B) during the design stage
C) during the customer-service stage
D) during the marketing stage
Answer: A
Diff: 2
Terms: cost incurrence, locked-in costs
Objective: 5
AACSB: Reflective thinking

9) Value engineering can reduce all of the following EXCEPT:
A) existing fixed manufacturing costs
B) value-added costs
C) nonvalue-added costs
D) rework-hours
Answer: A
Diff: 2
Terms: value engineering
Objective: 5
AACSB: Reflective thinking

10) A graph comparing locked-in costs with incurred costs will have:
A) locked-in costs rising much faster initially, but dropping to zero after the product is manufactured
B) the two cost lines running parallel until the end of the process, when they join
C) locked-in costs rising much faster initially than the incurred cost, but joining the incurred cost line at the completion of the value-chain functions
D) no differences unless the product is manufactured inefficiently
Answer: C
Diff: 2
Terms: locked-in costs, cost incurrence
Objective: 5
AACSB: Reflective thinking
11) Graphic analysis of incurred and locked-in costs provides several insights as to how the different concepts influence decisions. Which of the following statements is FALSE?
A) Costs are generally locked in before they are incurred.
B) After a product's design has been approved, costs are difficult to influence.
C) When and how costs are locked in are more important than when and how costs are incurred.
D) Most costs are locked in during the manufacturing process.
Answer: D
Diff: 2
Terms: locked-in costs, cost incurrence
Objective: 5
AACSB: Reflective thinking

12) Value engineering can reduce costs by all of the following EXCEPT:
A) simplifying the design and thereby decreasing the number of component parts
B) reducing the number of features offered
C) redesigning alternative options over and over until the wishes of all cross-functional team members are accommodated
D) building efficiencies into value-added costs
Answer: C
Diff: 3
Terms: value engineering
Objective: 5
AACSB: Reflective thinking

13) A locked-in cost is a(n):
A) opportunity cost that is fixed in the short run
B) cost that can be changed in the short run
C) cost that has not yet been incurred, but based on decisions that have already been made, will be incurred in the future
D) cost that has been incurred, but based on decisions that have already been made, will be not incurred in the future
Answer: C
Diff: 2
Terms: locked-in costs
Objective: 5
AACSB: Reflective thinking

14) Locked-in costs, or designed-in costs, are costs that have NOT yet been incurred but, based on decisions that have already been made, will be incurred in the future.
Answer: TRUE
Diff: 2
Terms: locked-in costs, cost incurrence
Objective: 5
AACSB: Reflective thinking
15) Locked-in costs have already been incurred.
Answer: FALSE
Explanation: Locked-in costs are those costs that have not yet been incurred, but which, based on decisions that have already been made, will be incurred in the future.
Diff: 2
Terms: target price
Objective: 5
AACSB: Reflective thinking

16) For manufacturing firms, product costs are generally locked in during the manufacturing stage.
Answer: FALSE
Explanation: For manufacturing firms, product costs are generally locked in during the design stage.
Diff: 2
Terms: locked-in costs
Objective: 5
AACSB: Reflective thinking

17) Spending more on the design phase of a new product usually reduces subsequent product-related costs.
Answer: TRUE
Diff: 2
Terms: designed-in costs, life-cycle costing
Objective: 5
AACSB: Reflective thinking

18) Customers are sometimes willing to pay for nonvalue-added costs.
Answer: FALSE
Explanation: A nonvalue-added cost is a cost that, if eliminated, would not reduce the actual or perceived value or utility (usefulness) customers obtain from using the product or service. It is a cost that the customer is unwilling to pay for.
Diff: 1
Terms: nonvalue-added costs
Objective: 5
AACSB: Analytical skills

19) Kaizen costing focuses on improving productivity and eliminating waste through continuous improvements.
Answer: TRUE
Diff: 1
Terms: target cost per unit
Objective: 5
AACSB: Reflective thinking

20) Compare target costing and kaizen costing.
Answer: Target costing focuses on reducing costs for products during the design stage. Kaizen costing focuses on reducing costs for products in the manufacturing stage.
Diff: 2
Terms: target cost per unit
Objective: 4, 5
AACSB: Reflective thinking
21) Explain the difference between locked in costs and costs incurred. Which of these types of costs does a traditional accounting system emphasize? At which stage of the value chain are most costs locked-in? At which stage of the value chain are most costs incurred? What implication does this have for good cost management?

Answer: Locked-in costs are costs that have not been incurred yet, but based on decisions that have already been made, will be incurred in the future. Traditional accounting systems focus upon incurred costs, or costs as they happen. Most costs are actually locked-in at the design stage, but they are not incurred until the manufacturing stage. Good cost management depends, therefore, on a great deal of attention given to costs at the design stage since it may not be possible to influence costs at the manufacturing stage because the costs are locked-in at that time.

Diff: 2
Terms: costs incurred, locked-in costs
Objective: 5
AACSB: Reflective thinking

Objective 12.6

1) The cost-plus pricing approach is generally in the form:
A) Cost base + Markup component = Prospective selling price
B) Prospective selling price - Cost base = Markup component
C) Cost base + Gross margin = Prospective selling price
D) Variable cost + Fixed cost + Contribution margin = Prospective selling price

Answer: A
Diff: 1
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking

2) In cost-plus pricing, the markup component:
A) is a rigid number
B) is ultimately determined by the market
C) provides a means to calculate the actual selling price
D) is the end rather than the start of pricing decisions

Answer: B
Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking

3) A product's markup percentage needs to cover nonmanufacturing variable costs when the cost base is:
A) the full cost of the product
B) the variable cost of the product
C) variable manufacturing costs
D) All of these answers are correct.

Answer: C
Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking
4) A product's markup percentage needs to cover operating profits when the cost base is:
A) the full cost of the product
B) the variable cost of the product
C) variable manufacturing costs
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking

5) Samuels Company is considering pricing its 10,000-gallon petroleum tanks using either variable manufacturing or full product costs as the base. The variable cost base provides a prospective price of $6,000 and the full cost base provides a prospective price of $6,100. The difference between the two prices is:
A) the estimated amount of profit
B) that the variable cost base estimates fixed costs in the markup percentage while the full cost base includes an amount for fixed costs
C) known as price discrimination
D) caused by the inability of most companies to estimate fixed cost per unit with any degree of reliability
Answer: B
Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking

6) ________ starts with estimated product costs and next adds desired operating income.
A) Cost-plus pricing
B) Target costing
C) Kaizen costing
D) Life-cycle budgeting
Answer: A
Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking

7) The amount of markup percentage is usually higher if:
A) there is idle capacity
B) demand is strong
C) competition is intense
D) demand is elastic
Answer: B
Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking
8) The markup percentage is usually higher if the cost base used is:
A) the full cost of the product
B) the variable cost of the product
C) variable manufacturing costs
D) total manufacturing costs
Answer: C
Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking

9) Which of the following statements is FALSE regarding cost-plus pricing?
A) A company selects a cost base that it regards as reliable.
B) A company uses a markup percentage that estimates a product price that covers full product costs and earns the required return on investment.
C) The selling price computed is only a prospective price.
D) The cost-plus price chosen has already been studied for customer reaction to the price.
Answer: D
Diff: 3
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking

10) Advantages of using the full cost of the product as the cost base include all of the following EXCEPT that:
A) managers are informed regarding the minimum long-run cost they need to recover to stay in business
B) it limits the ability of a salesperson to cut prices
C) fixed cost allocations can be arbitrary
D) it does not require a detailed analysis of cost behavior for computations
Answer: C
Diff: 3
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking
Answer the following questions using the information below:

Timothy Company has invested $1,000,000 in a plant to make vending machines. The target operating income desired from the plant is $150,000 annually. The company plans annual sales of 1,500 vending machines at a selling price of $1,000 each.

11) What is the target rate of return on investment for Timothy Company?
   A) 15.0%
   B) 17.6%
   C) 10.0%
   D) 11.1%
   Answer: A
   Explanation:  A) $150,000 / $1,000,000 = 15%
   Diff: 2
   Terms:  target rate of return on investment
   Objective: 6
   AACSB:  Analytical skills

12) What is the markup percentage as a percentage of cost for Timothy Company?
   A) 15.0%
   B) 17.6%
   C) 10.0%
   D) 11.1%
   Answer: D
   Explanation:  D) $150,000 / [(1,500 × $1,000) - $150,000] = 11.1%
   Diff: 2
   Terms:  cost-plus pricing
   Objective: 6
   AACSB:  Analytical skills

13) What is the cost base of each vending machine for Timothy Company?
   A) $720
   B) $900
   C) $850
   D) $890
   Answer: B
   Explanation:  B) [(1,500 × $1,000) - $150,000]/1,500 = $900
   Diff: 3
   Terms:  cost-plus pricing
   Objective: 6
   AACSB:  Analytical skills
Answer the following questions using the information below:

Thornton Company has invested $2,000,000 in a plant to make commercial juicer machines. The target operating income desired from the plant is $360,000 annually. The company plans annual sales of 7,000 juicer machines at a selling price of $400 each.

14) What is the target rate of return on investment for Thornton Company?
A) 22.0%
B) 18.0%
C) 14.8%
D) 12.9%
Answer: B
Explanation: B) $360,000 / $2,000,000 = 18%
Diff: 2
Terms: target rate of return on investment
Objective: 6
AACSB: Analytical skills

15) What is the markup percentage as a percentage of cost for Thornton Company?
A) 22.0%
B) 18.0%
C) 14.8%
D) 12.9%
Answer: C
Explanation: C) $360,000 / [(7,000 × $400) - $360,000] = 14.8%
Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Analytical skills

16) What is the cost base of each juicer machine for Thornton Company?
A) $349
B) $324
C) $338
D) $304
Answer: A
Explanation: A) [(7,000 × $400) - $360,000]/7,000 = $349
Diff: 3
Terms: cost-plus pricing
Objective: 6
AACSB: Analytical skills
Answer the following questions using the information below:

Oscar Corporation budgeted the following costs for the production of its one and only product for the next fiscal year:

<table>
<thead>
<tr>
<th>Costs</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$1,125,000</td>
</tr>
<tr>
<td>Direct labor</td>
<td>$780,000</td>
</tr>
<tr>
<td>Manufacturing overhead</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>$840,000</td>
</tr>
<tr>
<td>Fixed</td>
<td>$645,000</td>
</tr>
<tr>
<td>Selling and administrative</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>$360,000</td>
</tr>
<tr>
<td>Fixed</td>
<td>$480,000</td>
</tr>
<tr>
<td>Total costs</td>
<td>$4,230,000</td>
</tr>
</tbody>
</table>

Oscar has an annual target operating income of $900,000.

17) The markup percentage for setting prices as a percentage of total manufacturing costs is:
   A) 51%
   B) 125%
   C) 185%
   D) 245%
   Answer:  A
   Explanation:  A) ($900,000 + $360,000 + $480,000) / ($1,125,000 + $780,000 + $840,000 + $645,000) = 51.3%
   Diff: 3
   Terms:  cost-plus pricing
   Objective:  6
   AACSB:  Analytical skills

18) The markup percentage for setting prices as a percentage of variable manufacturing costs is:
   A) 54%
   B) 87%
   C) 169%
   D) 122%
   Answer:  C
   Explanation:  C) ($900,000 + $840,000 + $645,000 + $360,000 + $480,000) / ($1,125,000 + $780,000) = 169.3%
   Diff: 3
   Terms:  cost-plus pricing
   Objective:  6
   AACSB:  Analytical skills
19) The markup percentage for setting prices as a percentage of the variable cost of the product is:
A) 328%
B) 36%
C) 228%
D) 65%
Answer: D
Explanation: D) \( \frac{($900,000 + $645,000 + $480,000)}{($1,125,000 + $780,000 + $840,000 + $360,000)} = 65.2\% \)
Diff: 3
Terms: cost-plus pricing
Objective: 6
AACSB: Analytical skills

20) The markup percentage for setting prices as a percentage of the full cost of the product is:
A) 328%
B) 36%
C) 228%
D) 21%
Answer: D
Explanation: D) \( \frac{$900,000}{$4,230,000} = 21.3\% \)
Diff: 3
Terms: cost-plus pricing
Objective: 6
AACSB: Analytical skills

21) Under the cost-plus approach to pricing products, all of the following are prospective cost bases EXCEPT:
A) full product cost
B) target cost
C) variable manufacturing cost
D) variable product cost
Answer: B
Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking

22) In cost-plus pricing, the markup is a rigid number that determines the actual selling price.
Answer: FALSE
Explanation: Managers use the cost-plus pricing formula as a starting point. The markup component is rarely a rigid number. Instead, it is flexible, depending on the behavior of customers and competitors.
Diff: 2
Terms: cost incurrence
Objective: 6
AACSB: Reflective thinking
23) The target rate of return on investment is another way of referring to the markup percentage.
Answer: FALSE
Explanation: The target rate of return on investment and the markup percentage are two different things.
Diff: 2
Terms: target rate of return on investment
Objective: 6
AACSB: Reflective thinking

24) Cost bases that include fewer costs also have lower markups.
Answer: FALSE
Explanation: Cost bases that include fewer costs have higher markups.
Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking

25) Markups tend to be higher in more competitive markets.
Answer: FALSE
Explanation: Markups tend to be lower in more competitive markets.
Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking

26) The full-cost formula for pricing is relatively simple to use because it does NOT require a detailed analysis of cost behavior.
Answer: TRUE
Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking

27) A full-cost base rather than a variable-cost base is a better guide for discounting decisions that may affect long-term customers.
Answer: TRUE
Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking

28) One market-based pricing method is called the time and materials method.
Answer: FALSE
Explanation: The time and materials method is a cost-plus pricing method. The price charged for materials equals the materials cost plus a markup and the price charged for labor equals the labor cost plus a markup. The markups are chosen to recover overhead costs and to earn a profit.
Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking
29) When demand is strong, firms usually increase markups.
Answer: TRUE
Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Reflective thinking

30) Nancy Company has budgeted sales of $300,000 with the following budgeted costs:

<table>
<thead>
<tr>
<th>Direct materials</th>
<th>$60,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct manufacturing labor</td>
<td>40,000</td>
</tr>
<tr>
<td>Factory overhead</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>30,000</td>
</tr>
<tr>
<td>Fixed</td>
<td>50,000</td>
</tr>
<tr>
<td>Selling and administrative expenses</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>20,000</td>
</tr>
<tr>
<td>Fixed</td>
<td>30,000</td>
</tr>
</tbody>
</table>

Compute the average markup percentage for setting prices as a percentage of:

a. The full cost of the product
b. The variable cost of the product
c. Variable manufacturing costs
d. Total manufacturing costs

Answer:

a. $60,000 + $40,000 + $30,000 + $50,000 + $20,000 + $30,000 = $230,000
   ($300,000 - $230,000)/$230,000 = 30.4%

b. $60,000 + $40,000 + $30,000 + $20,000 = $150,000
   ($300,000 - $150,000)/$150,000 = 100%

c. $60,000 + $40,000 + $30,000 = $130,000
   ($300,000 - $130,000)/$130,000 = 130.8%

d. $60,000 + $40,000 + $30,000 + $50,000 = $180,000
   ($300,000 - $180,000)/$180,000 = 66.7%

Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Analytical skills
31) Timothy Company has budgeted sales of $780,000 with the following budgeted costs:

<table>
<thead>
<tr>
<th>Cost Category</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$168,000</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>132,000</td>
</tr>
<tr>
<td>Factory overhead</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>96,000</td>
</tr>
<tr>
<td>Fixed</td>
<td>108,000</td>
</tr>
<tr>
<td>Selling and administrative expenses</td>
<td></td>
</tr>
<tr>
<td>Variable</td>
<td>72,000</td>
</tr>
<tr>
<td>Fixed</td>
<td>100,000</td>
</tr>
</tbody>
</table>

Compute the average markup percentage for setting prices as a percentage of:

a. Total manufacturing costs
b. The variable cost of the product
c. The full cost of the product
d. Variable manufacturing costs

Answer:

a. $168,000 + $132,000 + $96,000 + $108,000 = $504,000
   ($780,000 - $504,000)/$504,000 = 54.8%

b. $168,000 + $132,000 + $96,000 + $72,000 = $468,000
   ($780,000 - $468,000)/$468,000 = 66.7%

c. $168,000 + $132,000 + $96,000 + $108,000 + $72,000 + $100,000 = $676,000
   ($780,000 - $676,000)/$676,000 = 15.4%

d. $168,000 + $132,000 + $96,000 = $396,000
   ($780,000 - $396,000)/$396,000 = 97%

Diff: 2
Terms: cost-plus pricing
Objective: 6
AACSB: Analytical skills

Objective 12.7

1) Life-cycle costing is the name given to:
A) a method of cost planning to reduce manufacturing costs to targeted levels
B) the process of examining each component of a product to determine whether its cost can be reduced
C) the process of managing all costs along the value chain
D) a system that focuses on reducing costs during the manufacturing cycle

Answer: C
Diff: 2
Terms: life-cycle costing
Objective: 7
AACSB: Reflective thinking
2) An understanding of life-cycle costs can lead to:
A) additional costs during the manufacturing cycle
B) less need for evaluation of the competition
C) cost effective product designs that are easier to service
D) mutually beneficial relationships between buyers and sellers
Answer: C
Diff: 2
Terms: life-cycle costing
Objective: 7
AACSB: Reflective thinking

3) Life-cycle budgeting is particularly important when:
A) the development period for R&D is short and inexpensive
B) there are significant nonproduction costs
C) most costs are locked in during production
D) a low percentage of costs are incurred before any revenues are received
Answer: B
Diff: 3
Terms: life-cycle budgeting
Objective: 7
AACSB: Reflective thinking

4) Life-cycle budgeting and life-cycle costing help highlight:
A) an increase in customer-service costs due to using inferior materials
B) high production costs caused by a complex design
C) large ordering costs due to the great number of component parts used
D) an increase in annual operating income resulting from the new product
Answer: D
Diff: 3
Terms: life-cycle costing, life-cycle budgeting
Objective: 7
AACSB: Reflective thinking

5) Life-cycle budgeting:
A) has little in common with target pricing
B) is most useful to companies that manufacture small items such as household plastics
C) helps companies estimate revenues over a multiyear horizon
D) gives companies more insight into total costs when manufacturing costs consume the majority of the resources
Answer: C
Diff: 2
Terms: life-cycle budgeting
Objective: 7
AACSB: Reflective thinking
6) Customer life-cycle costs are the:
A) costs incurred by the selling company to satisfy the customer
B) costs to the customer for buying and using a product
C) same as the selling life-cycle prices
D) replacement costs of using a product or service
Answer: B
Diff: 1
Terms: customer life-cycle costs
Objective: 7
AACSB: Reflective thinking

Answer the following questions using the information below:

Bicker, Inc., is in the process of evaluating a new product using the following information:
· A new transformer has two production runs each year, each with $10,000 in setup costs.
· The new transformer incurred $30,000 in development costs and is expected to be produced over the next three years.
· Direct costs of producing the transformers are $40,000 per run of 5,000 transformers each.
· Indirect manufacturing costs charged to each run are $45,000.
· Destination charges for each transformer average $1.00.
· Customer service expenses average $0.20 per transformer.
· The transformers are selling for $25 the first year and will increase by $3 each year thereafter.
· Sales units equal production units each year.

7) What are estimated life-cycle revenues?
A) $250,000
B) $280,000
C) $310,000
D) $840,000
Answer: D
Explanation: D) First year (5,000 × 2 runs × $25) $250,000
Second year (5,000 × 2 × $28) 280,000
Third year (5,000 × 2 × $31) 310,000
Total $840,000
Diff: 2
Terms: life-cycle costing, life-cycle budgeting
Objective: 7
AACSB: Analytical skills
8) What is the estimated life-cycle operating income for the first year?
A) $18,000
B) $20,000
C) $48,000
D) $119,000
Answer: A
Explanation:
A) Sales (5,000 units × 2 runs × $25) $250,000
Development costs $30,000
Setup costs (2 × $10,000) 20,000
Direct manufacturing costs (2 × $40,000) 80,000
Indirect manufacturing costs (2 × $45,000) 90,000
Destination charges ($1.00 × 10,000) 10,000
Customer service ($0.20 × 10,000) 2,000
Estimated life-cycle operating income for the first year $ 18,000
Diff: 3
Terms: life-cycle costing, life-cycle budgeting
Objective: 7
AACSB: Analytical skills

9) What is the estimated life-cycle operating income for the first three years?
A) $174,000
B) $204,000
C) $636,000
D) $840,000
Answer: B
Explanation: B)
<table>
<thead>
<tr>
<th>Life-cycle revenue</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Totals</th>
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<tr>
<td>Life-cycle revenue</td>
<td>$250,000</td>
<td>$280,000</td>
<td>$310,000</td>
<td>$840,000</td>
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</table>

<table>
<thead>
<tr>
<th>Life-cycle costs:</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
<th>Totals</th>
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<tr>
<td>Development</td>
<td>30,000</td>
<td>30,000</td>
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<tr>
<td>Setup</td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
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<tr>
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<tr>
<td>Destination charges</td>
<td>10,000</td>
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<td>10,000</td>
<td>30,000</td>
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<tr>
<td>Customer service</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
<td>6,000</td>
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<tr>
<td>Total costs</td>
<td>$232,000</td>
<td>$202,000</td>
<td>$202,000</td>
<td>$636,000</td>
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</table>

<table>
<thead>
<tr>
<th>Life-cycle operating income</th>
<th>$204,000</th>
</tr>
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<tbody>
<tr>
<td>Diff: 3</td>
<td></td>
</tr>
<tr>
<td>Terms: life-cycle costing, life-cycle budgeting</td>
<td></td>
</tr>
<tr>
<td>Objective: 7</td>
<td></td>
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<tr>
<td>AACSB: Analytical skills</td>
<td></td>
</tr>
</tbody>
</table>
Moises, Black, Elderberry and Associates are in the process of evaluating its new client services for the business consulting division.

- Estate Planning, a new service, incurred $300,000 in development costs and employee training.
- The direct costs of providing this service, which is all labor, averages $50 per hour.
- Other costs for this service are estimated at $1,000,000 per year.
- The current program for estate planning is expected to last for two years. At that time, a new law will be in place that will require new operating guidelines for the tax consulting.
- Customer service expenses average $200 per client, with each job lasting an average of 400 hours. The current staff expects to bill 40,000 hours for each of the two years the program is in effect. Billing averages $70 per hour.

10) What are estimated life-cycle revenues?
A) $3,200,000
B) $4,000,000
C) $5,600,000
D) $11,200,000
Answer: C
Explanation:
C) First year (40,000 × $70) $ 2,800,000
Second year (40,000 × $70) 2,800,000
Total $5,600,000
Diff: 1
Terms: life-cycle costing, life-cycle budgeting
Objective: 7
AACSB: Analytical skills

11) What is estimated life-cycle operating income for the first year?
A) $(520,000)
B) $(700,000)
C) $2,800,000
D) $3,320,000
Answer: A
Explanation:
A) Revenue (40,000 hours × $70) $2,800,000
Development costs $ 300,000
Direct costs (40,000 × $50) 2,000,000
Indirect costs 1,000,000
Customer service ($200 × 100 clients) 20,000 3,320,000
Operating income (loss) $(520,000)
Diff: 3
Terms: life-cycle costing, life-cycle budgeting
Objective: 7
AACSB: Analytical skills
12) What is the estimated life-cycle operating income for the first two years?
A) $(740,000)
B) $(700,000)
C) $1,600,000
D) $5,600,000
Answer: A
Explanation:  

<table>
<thead>
<tr>
<th></th>
<th>Year 1</th>
<th>Year 2</th>
<th>Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Life-cycle revenue</td>
<td>$2,800,000</td>
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<td>$5,600,000</td>
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<td>2,000,000</td>
<td>2,000,000</td>
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<tr>
<td>Indirect costs</td>
<td>1,000,000</td>
<td>1,000,000</td>
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<tr>
<td>Customer service</td>
<td>20,000</td>
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</tr>
<tr>
<td>Total costs</td>
<td>$3,320,000</td>
<td>$3,020,000</td>
<td>$6,340,000</td>
</tr>
</tbody>
</table>

Life-cycle operating income $(740,000)

Diff: 3
Terms: life-cycle costing, life-cycle budgeting
Objective: 7
AACSB: Analytical skills

Answer the following questions using the information below:

Knowledge Transfer Associates is in the process of evaluating its new client services for the business systems consulting division.

- Server Planning, a new service, incurred $250,000 in development costs.
- The direct costs of providing the service, which is all labor, averages $50 per hour.
- Other costs for this service are estimated at $300,000 per year.
- The current program for server planning is expected to last for two years. At that time, expected new operating systems are likely to make the service non viable.
- Customer service expenses average $250 per client, with each job lasting an average of 40 hours.

The current staff expects to bill 15,000 hours for each of the two years the program is in effect. Billing averages $90 per hour.

13) What are the estimated life-cycle revenues?
A) $2,700,000
B) $3,000,000
C) $3,400,000
D) $1,350,000
Answer: A
Explanation:  
A) First year (15,000 × $90) $ 1,350,000
Second year (15,000 × $90) 1,350,000
Total $2,700,000

Diff: 1
Terms: life-cycle costing, life-cycle budgeting
Objective: 7
AACSB: Analytical skills
14) What is the estimated life-cycle operating income for the first year?
A) $206,250
B) $162,500
C) $(43,750)
D) $43,750
Answer: C
Explanation:
C) Revenue (15,000 hours × $90) $1,350,000
Development costs $ 250,000
Direct costs (15,000 × 50) 750,000
Indirect costs 300,000
Customer service ($250 × 375 clients) 93,750
Operating income (loss) $(43,750)
Diff: 3
Terms: life-cycle costing, life-cycle budgeting
Objective: 7
AACSB: Analytical skills

15) Life-cycle costing tracks and accumulates business function costs across the entire value chain from a product's initial R&D to its final customer service and support.
Answer: TRUE
Diff: 2
Terms: life-cycle costing
Objective: 7
AACSB: Reflective thinking

16) Life-cycle budgeting is particularly important when nonproduction costs are significant.
Answer: TRUE
Diff: 2
Terms: life-cycle budgeting
Objective: 7
AACSB: Reflective thinking

17) The product life cycle spans the time from initial R&D on a product to when customer service and support is no longer offered for that product.
Answer: TRUE
Diff: 2
Terms: product life-cycle
Objective: 7
AACSB: Reflective thinking

18) Customer life-cycle costs focus on total costs incurred by the customer from purchase to disposal.
Answer: TRUE
Diff: 1
Terms: customer life-cycle costs
Objective: 7
AACSB: Reflective thinking
19) Life-cycle budgeting estimates the costs and revenues attributed to a product from its initial R&D through production of a prototype product.
Answer: FALSE
Explanation: Life-cycle budgeting estimates the costs and revenues attributed to a product from its initial R&D through its final customer service and support.
Diff: 2
Terms: life-cycle budgeting
Objective: 7
AACSB: Reflective thinking

20) A firm using product life-cycle reporting will have a calendar-based focus for this report.
Answer: FALSE
Explanation: A firm using product life-cycle reporting will not necessarily have a calendar-based focus for this report since life-cycle reporting is a multiyear concept.
Diff: 2
Terms: product life-cycle
Objective: 7
AACSB: Reflective thinking
21) Henderson Company is in the process of evaluating a new part using the following information.

- Part SLC2002 has one production run each month, each with $16,000 in setup costs.
- Part SLC2002 incurred $40,000 in development costs and is expected to be produced over the next three years.
- Direct costs of producing Part SLC2002 are $56,000 per run of 24,000 parts each.
- Indirect manufacturing costs charged to each run are $88,000.
- Destination charges for each run average $18,000.
- Part SLC2002 is selling for $12.50 in the United States and $25 in all other countries. Sales are one-third domestic and two-thirds exported.
- Sales units equal production units each year.

**Required:**

a. What are the estimated life-cycle revenues?

b. What is the estimated life-cycle operating income for the first year?

**Answer:**

a. Domestic ($12.50 × 12 months × 24,000 × 3 yrs. × 1/3) $3,600,000

Export ($25 × 12 months × 24,000 × 3 yrs. × 2/3) 14,400,000

Estimated life-cycle revenues $18,000,000

b. Sales

| Domestic ($12.50 × 12 months × 24,000 × 1/3) | $1,200,000 |
| Export ($25 × 12 months × 24,000 × 2/3) | 4,800,000 |

Total Sales 6,000,000

Costs:

| Development costs | $40,000 |
| Setup costs (12 × $16,000) | 192,000 |
| Direct manufacturing costs (12 × $56,000) | 672,000 |
| Indirect manufacturing costs (12 × $88,000) | 1,056,000 |
| Destination costs (12 × $18,000) | 216,000 2,176,000 |

Estimated life-cycle operating income, first year $3,824,000

Diff: 3
Terms: life-cycle costing, life-cycle budgeting
Objective: 7
AACSB: Analytical skills
22) Stone and Bicker are starting a new business venture and are in the process of evaluating their product lines. Information for one new product, hand-made lamps, is as follows:

- Every six months a new lamp pattern will be put into production. Each new pattern will require $11,200 in setup costs.
- The lamp product line incurred $48,000 in development costs and is expected to be produced over the next six years.
- Direct costs of producing the lamps average $144 each. Each lamp requires 12 labor-hours and 2 machine-hours.
- Indirect manufacturing costs are estimated at $160,000 per year.
- Customer service expenses average $16 per lamp.
- Current sales are expected to be 2,000 units of each lamp pattern. Each lamp sells for $224.
- Sales units equal production units each year.

**Required:**

a. What are the estimated life-cycle revenues?
b. What is the estimated life-cycle operating income for the first year?

**Answer:**

a. Estimated life-cycle revenues:

\[
(2,000 \times 2 \text{ patterns per year} \times $224 \text{ per lamp}) \times 6 \text{ years} = 5,376,000
\]

b. Annual revenues (2,000 × $224 × 2) $896,000

\[
\begin{align*}
\text{Setup costs ($11,200 × 2)} & = 22,400 \\
\text{Development costs} & = 48,000 \\
\text{Direct manufacturing costs (2,000 × $144 × 2)} & = 576,000 \\
\text{Indirect manufacturing costs} & = 160,000 \\
\text{Customer service costs ($16 × 2,000 lamps × 2)} & = 64,000
\end{align*}
\]

Estimated life-cycle operating income for the first year $25,600

**Diff:** 2

**Terms:** life-cycle costing, life-cycle budgeting

**Objective:** 7

**AACSB:** Analytical skills
23) Grace Greeting Cards Incorporated is starting a new business venture and are in the process of evaluating its product lines. Information for one new product, traditional parchment grade cards, is as follows:

- Sixteen times each year, a new card design will be put into production. Each new design will require $600 in setup costs.
- The parchment grade card product line incurred $75,000 in development costs and is expected to be produced over the next four years.
- Direct costs of producing the designs average $0.50 each.
- Indirect manufacturing costs are estimated at $50,000 per year.
- Customer service expenses average $0.10 per card.
- Current sales are expected to be 2,500 units of each card design. Each card sells for $3.50.
- Sales units equal production units each year.

**Required:**

a. What are the estimated life-cycle revenues?
b. What is the estimated life-cycle operating income for the first year?
c. What is the estimated life-cycle operating income per year for the years after the first year?
d. What is the total estimated life-cycle operating income?

**Answer:**

a. Estimated life-cycle revenues:

\[
\text{(2,500 \times 16 \text{ designs per year} \times \$3.50 \text{ per card sold})} \times 4 \text{ years} = \$140,000 \times 4 = \$560,000
\]

b. Annual revenues (2,500 \times \$3.50 \times 16) = \$140,000

\[
\begin{align*}
\text{Development costs} & \quad \$75,000 \\
\text{Setup costs ($600 \times 16)} & \quad 9,600 \\
\text{Direct manufacturing costs (2,500 \times $0.50 \times 16)} & \quad 20,000 \\
\text{Indirect manufacturing costs} & \quad 50,000 \\
\text{Customer service costs ($0.10 \times 2,500 \text{ cards} \times 16)} & \quad 4,000 \quad 158,600
\end{align*}
\]

Estimated life-cycle operating income (loss) for the first year = \$(18,600)

c. Annual revenues (2,500 \times \$3.50 \times 16) = \$140,000

\[
\begin{align*}
\text{Setup costs ($600 \times 16)} & \quad \$9,600 \\
\text{Direct manufacturing costs (2,500 \times $0.50 \times 16)} & \quad 20,000 \\
\text{Indirect manufacturing costs} & \quad 50,000 \\
\text{Customer service costs ($0.10 \times 2,500 \text{ cards} \times 16)} & \quad 4,000 \quad 83,600
\end{align*}
\]

Estimated life-cycle operating income (loss) for the first year = \$56,400

d. Estimated life-cycle operating income for all four years = \$150,600

\[
(3 \times \$56,400 - \$18,600)
\]

**Diff:** 2

Terms: life-cycle costing, life-cycle budgeting

Objective: 7

AACSB: Analytical skills
24) Ski Valet provides materials that let people teach themselves how to snow ski. It has six different skill-level programs. Each one includes visual and audio learning aids along with a workbook that can be submitted to the company for grading and evaluation purposes, if the person so desires.

The accounting system of Ski Valet is very traditional in its reporting functions with the calendar year being the company's fiscal year. It includes an abundance of information that can be used for various reporting purposes.

The company has found that any new idea soon runs its course with an effective life of about three years. Therefore, the company is always in the development stage of some new program. Program development requires experts in the area to provide the know-how of the item being developed and a development team that puts together the video, audio, and workbook materials. The actual costs of reproducing the packages are relatively inexpensive when compared to the development costs.

Required:
How might product life-cycle budgeting aid the company in improving its overall operations?
Answer: Because the product life cycle for Ski Valet extends over several traditional accounting periods, it is critical for the company to consider a planning concept that evaluates each one of its products during its entire life cycle. Procedures that highlight an entire life cycle can include items for overall profitability, and which products might be repeated in a few years. With a large portion of their expenses in the development area, life-cycle budgeting can assist in predicting the sales needs for the entire life of a product.

It is probably more important to evaluate company performance on a product basis rather than year to year. Life-cycle budgeting would allow the company to compare products to each other rather than just comparing one year to the next.

Diff: 2
Terms: life-cycle budgeting
Objective: 7
AACSB: Reflective thinking
Objective 12.8

Answer the following questions using the information below:

Knowledge Transfer Associates is in the process of evaluating its new client services for the business systems consulting division.

- Server Planning, a new service, incurred $250,000 in development costs.
- The direct costs of providing the service, which is all labor, averages $50 per hour.
- Other costs for this service are estimated at $300,000 per year.
- The current program for server planning is expected to last for two years. At that time, expected new operating systems are likely to make the service non viable.
- Customer service expenses average $250 per client, with each job lasting an average of 40 hours.

The current staff expects to bill 15,000 hours for each of the two years the program is in effect. Billing averages $90 per hour.

1) What is the estimated life-cycle operating income for both years combined?
   A) $206,250
   B) $162,500
   C) $(43,750)
   D) $(87,500)
   Answer: B
   Explanation:
   Year 1
   Year 2
   Totals
   Life-cycle revenue $1,350,000 $1,350,000 $2,700,000
   Life-cycle costs:
   Development 250,000 250,000
   Direct costs 750,000 750,000 1,500,000
   Indirect costs 300,000 300,000 600,000
   Customer service 93,750 93,750 187,500
   Total costs $1,393,750 $1,143,750 $2,537,500
   Life-cycle operating income $162,500
   Diff: 3
   Terms: life-cycle costing, life-cycle budgeting
   Objective: 8
   AACSB: Analytical skills

2) Price discrimination is the practice of:
   A) setting different prices for different products
   B) charging different prices for quantity amounts
   C) using variable costing for some products and full costing for other products when setting prices
   D) charging different prices to different customers or clients for the same products or services
   Answer: D
   Diff: 2
   Terms: price discrimination
   Objective: 8
   AACSB: Ethical reasoning
3) Iowa Utility Company charges its high-usage commercial customers a lower rate per kilowatt-hour than other customers. This is an example of:
   A) customer-preference pricing
   B) high-load pricing
   C) peak-load pricing
   D) price discrimination

Answer:  D
Diff:  1
Terms:  peak-load pricing
Objective:  8
AACSB:  Ethical reasoning

4) When demand for a product is inelastic and prices are increased, usually demand will:
   A) increase, and operating profits will increase
   B) remain the same, and operating profits will increase
   C) decrease, and operating profits will decrease
   D) remain the same, and operating profits will decrease

Answer:  B
Diff:  2
Terms:  price elasticity
Objective:  8
AACSB:  Reflective thinking

5) When demand for a product is very elastic and prices are increased, demand will:
   A) remain the same, and operating profits will increase
   B) remain the same, and operating profits may either increase or decrease
   C) decrease, and operating profits will decrease
   D) decrease, and operating profits may either increase or decrease

Answer:  D
Diff:  3
Terms:  price elasticity
Objective:  8
AACSB:  Reflective thinking

6) Costs are a major factor:
   A) when demand is price-inelastic
   B) when demand is price-elastic
   C) when the opportunity for price discrimination exists
   D) for peak-load pricing

Answer:  B
Diff:  2
Terms:  price elasticity
Objective:  8
AACSB:  Reflective thinking
Cox Lighting manufactures table lamps and is considering raising the price by $20 a unit for the coming year. With a $20 price increase, demand is expected to fall by 2,000 units.

<table>
<thead>
<tr>
<th></th>
<th>Currently</th>
<th>Projected</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demand</td>
<td>20,000 units</td>
<td>18,000 units</td>
</tr>
<tr>
<td>Selling price</td>
<td>$150</td>
<td>$170</td>
</tr>
<tr>
<td>Variable costs per unit</td>
<td>$100</td>
<td>$100</td>
</tr>
</tbody>
</table>

7) Would you recommend the $20 price increase?
   A) No, because demand decreased.
   B) No, because the selling price increases.
   C) Yes, because contribution margin per unit increases.
   D) Yes, because operating income increases.
   Answer: D
   Explanation: D) \[18,000 \times ($170 - $100)\] - \[20,000 \times ($150 - $100)\] = $260,000 operating income increase
   Diff: 2
   Terms: price elasticity
   Objective: 8
   AACSB: Analytical skills

8) The demand for this product is:
   A) greatly inelastic
   B) slightly inelastic
   C) elastic
   D) indeterminable
   Answer: C
   Diff: 2
   Terms: price elasticity
   Objective: 8
   AACSB: Analytical skills
Answer the following questions using the information below:

Ernie Shavers, Inc. manufactures electric shavers and is considering decreasing the price by $3 a unit for the coming year. With a $3 price decrease, the unit demand is expected to increase by 25%, and a high volume materials discount is expected to decrease the variable costs per unit by $1 per unit.

<table>
<thead>
<tr>
<th>Currently</th>
<th>Projected</th>
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<tbody>
<tr>
<td>Demand</td>
<td>10,000 units</td>
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<tr>
<td>Selling price</td>
<td>$51</td>
</tr>
<tr>
<td>Variable costs per unit</td>
<td>$45</td>
</tr>
</tbody>
</table>

9) Would you recommend the $3 price decrease?
A) Yes, because demand increases.
B) No, because the selling price decreases.
C) No, because operating income decreases.
D) Yes, because contribution margin per unit increases.
Answer: C
Explanation: C) \[12,500 \times ($48 - $44)\] - \[10,000 \times ($51 - $45)\] = $10,000 operating income decrease
Diff: 2
Terms: price elasticity
Objective: 8
AACSB: Analytical skills

10) The demand for this product is:
A) elastic
B) slightly inelastic
C) greatly inelastic
D) indeterminable
Answer: A
Diff: 2
Terms: price elasticity
Objective: 8
AACSB: Analytical skills
11) The Maize Eagles are evaluating ticket prices for its basketball games. Studies show that Friday and Saturday night games average more than twice the fans of games on other days. The following information pertains to the stadium's normal operations per season:

- Average fans per game (all games) 2,500 fans
- Average fans per Friday and Saturday night games 3,500 fans
- Number of home games per season 30 games
- Stadium capacity 3,500 seats
- Variable operating costs per operating hour $2,000
- Marketing costs per season for basketball $138,750
- Customer-service costs per season for basketball $25,000

The stadium is open for 5 operating hours on each day a game is played. All employees work by the hour except for the administrators. A maximum of one game is played per day and each fan has only one ticket per game.

The stadium authority wants to charge more for games on Friday and Saturday. What is the minimum price that should be charged for peak attendance nights?

A) $4.40
B) $8.60
C) $6.19
D) $171.45

Answer: C

Explanation:

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>variable operating costs</td>
<td>$300,000</td>
</tr>
<tr>
<td>marketing</td>
<td>$138,750</td>
</tr>
<tr>
<td>customer service</td>
<td>$25,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$463,750</strong></td>
</tr>
</tbody>
</table>

Attendance = 30 × 2,500 = 75,000 fans

Minimum price = $463,750 / 75,000 = $6.1833

Diff: 3
Terms: price elasticity
Objective: 8
AACSB: Analytical skills
12) Hitz Video Rental is evaluating rental prices. Historical data show that Friday and Saturday have twice the rentals of other days of the week. The following information pertains to the store's normal operations per week:

- Average rentals per day on Friday and Saturday: 1,150
- Average rentals per day on Sunday through Thursday: 500
- Store hours per day: 12
- Total units available for rent: 10,000
- Variable operating costs per hour: $40
- Marketing costs per week: $1,500
- Customer service costs per week: $250

The store manager wants to charge more for rentals on Friday and Saturday. What is the minimum price that should be charged during peak rental days?

A) $0.60  
B) $0.83  
C) $0.90  
D) $1.07

Answer: D

Explanation:
- Variable costs ($40 \times 12 \times 7) = $3,360
- Marketing = $1,500
- Customer service = $250

Total costs per week = $5,110

Average rental cost per customer = $5,110 / [(2 \times 1,150) + (5 \times 500)] = $1.0645

Diff: 3
Terms: peak-load pricing
Objective: 8
AACSB: Analytical skills

13) When price discrimination is effective, cost is NOT a major factor in setting prices.
Answer: TRUE
Diff: 2
Terms: price discrimination
Objective: 8
AACSB: Reflective thinking

14) When demand is elastic, an increase in price will lead to an increase in profits.
Answer: FALSE
Explanation: When demand is inelastic, an increase in price will usually lead to an increase in profits.
Diff: 1
Terms: price elasticity
Objective: 8
AACSB: Reflective thinking
15) Peak-load pricing is the practice of charging a lower price for the same product or service when the
demand for it approaches the physical limit of the capacity to produce that product or service.
Answer: FALSE
Explanation: Peak-load pricing is the practice of charging a higher price for the same product or service
when the demand for it approaches the physical limit of the capacity to produce that product or service.
Diff: 1
Terms: peak-load pricing
Objective: 8
AACSB: Reflective thinking

16) Price discrimination is the practice of charging different customers different prices for the same
product or service.
Answer: TRUE
Diff: 1
Terms: price discrimination
Objective: 8
AACSB: Ethical reasoning

17) What factors may influence the level of markups?
Answer: Factors affecting the level of markups include the strength of demand, the elasticity of
demand, and the intensity of competition. In addition, strategic reasons also may influence the level of
markups. For instance, a firm may either choose a low markup to penetrate the market and win market
share from established products of its competitors, or employ a high markup if it employs a skimming
strategy for a market segment in which some customers are willing to pay higher prices for the privilege
of owning the product.
Diff: 2
Terms: cost-plus pricing
Objective: 6, 8
AACSB: Reflective thinking

18) A hotel in Orlando, Florida, experiences peak periods and slower times. How should prices be
adjusted during peak periods? During slow times? Why?
Answer: During peak periods the hotel can justify increased prices because of full capacity conditions,
whereas in slower periods when there is excess capacity, the hotel may want to lower prices to fill the
excess capacity.
Diff: 2
Terms: peak-load pricing
Objective: 8
AACSB: Reflective thinking
19) Clark Manufacturing offers two product lines, IN2 and EL5. The demand of the IN2 product line is inelastic, while the demand of the EL5 product line is very elastic. If Clark initiates a price increase for both product lines, how will customer demand change? How will the price increase affect operating profits?
Answer: For the inelastic product line, when prices are increased demand will stay approximately the same and profits would be expected to increase. For the elastic product line, the increased price will result in decreased demand (i.e., lower sales volume). Whether a profit or a loss results from this change will depend on the amount of decreased demand and the amount of the increased contribution margin due to the increase in price.
Diff: 2
Terms: price elasticity
Objective: 8
AACSB: Reflective thinking

20) What advice would you give a company to avoid the appearance of predatory pricing?
Answer: Useful advice for a company to avoid the appearance of predatory pricing would be (1) Collect data and keep detailed records of variable costs for all value chain functions; and (2) Review all proposed prices below variable cost in advance, with a presumption that claims of predatory intent would occur.
Diff: 2
Terms: predatory pricing
Objective: 8
AACSB: Reflective thinking

Objective 12.9

1) All of the following are true regarding price discrimination EXCEPT that:
A) the laws apply to service providers, but not manufacturers
B) it is permissible if price differences can be explained
C) it is illegal only if the intent is to destroy competition
D) it is most likely to occur when the cost base is the full cost of the product
Answer: D
Diff: 3
Terms: price discrimination
Objective: 9
AACSB: Ethical reasoning

2) Predatory pricing is a type of price discrimination that:
A) allows prices to be cut to the level of variable costs
B) is required when a company declares bankruptcy so that it can sell its remaining goods quickly
C) is used in the food industry for perishable goods
D) deliberately sets prices very low, sometimes even below costs, to minimize competition
Answer: D
Diff: 1
Terms: price discrimination, predatory pricing
Objective: 9
AACSB: Ethical reasoning
3) To minimize the chances of violating pricing laws, a company should:
A) keep detailed records of variable costs for all value-chain business functions
B) use a variable cost-plus markup method of pricing
C) underprice products on a consistent basis, rather than sporadically
D) use dumping only when a product is at the end of its life cycle
Answer: A
Diff: 3
Terms: price discrimination, predatory pricing
Objective: 9
AACSB: Ethical reasoning

4) Collusive pricing occurs when:
A) a company wants two products to sell for the same, or almost the same, amount
B) a company wants a product to sell for the same as a competitor's product
C) two or more companies agree to sell a product at a price higher than should be expected
D) competitors are part of the same large parent organization
Answer: C
Diff: 1
Terms: collusive pricing
Objective: 9
AACSB: Ethical reasoning

5) Price discrimination laws apply only to manufacturers.
Answer: TRUE
Diff: 2
Terms: price discrimination
Objective: 9
AACSB: Ethical reasoning

6) Price discrimination is only illegal if the intent is to destroy competition.
Answer: TRUE
Diff: 1
Terms: price discrimination
Objective: 9
AACSB: Ethical reasoning

7) A company engages in predatory pricing when it deliberately prices below its costs in an effort to drive competitors out of the market and restrict supply, and then raises prices rather than enlarge demand.
Answer: TRUE
Diff: 1
Terms: predatory pricing
Objective: 9
AACSB: Ethical reasoning
8) Price dumping occurs when a domestic company is trying to get rid of out-of-style products at a substantially reduced price.
Answer: FALSE
Explanation: Price dumping occurs when a non-U.S. company sells a product in the United States at a price below the market value where it is produced and this action threatens to injure an industry in the United States.
Diff: 1
Terms: dumping
Objective: 9
AACSB: Multiculturalism and diversity

9) Collusive pricing occurs when companies in an industry conspire in their pricing and production decisions to achieve a price above the competitive price and so restrain trade.
Answer: TRUE
Diff: 1
Terms: collusive pricing
Objective: 9
AACSB: Ethical reasoning

10) Peak-load pricing is a form of price discrimination and is illegal.
Answer: FALSE
Explanation: Peak-load pricing is not considered a form of price discrimination and it is legal unless its intent is to destroy competition.
Diff: 2
Terms: peak-load pricing
Objective: 9
AACSB: Ethical reasoning

11) To comply with antitrust laws, a company must NOT engage in predatory pricing, dumping, or collusive pricing which lessen competition, put another company at a competitive disadvantage, or harm consumers.
Answer: TRUE
Diff: 2
Terms: predatory pricing, dumping, collusive pricing
Objective: 9
AACSB: Ethical reasoning

12) What is price discrimination, and when is it illegal?
Answer: Price discrimination is charging some customers a higher price for a given product or service than other customers. It is permissible if differences in prices can be justified by differences in costs and it is illegal only if the intent is to lessen or prevent competition for customers.
Diff: 2
Terms: price discrimination
Objective: 9
AACSB: Reflective thinking
Objective 13.1

1) ______ describes how an organization matches its own capabilities with the opportunities in the marketplace to accomplish its overall objectives.
A) Strategy
B) Planning
C) Learning and growth perspective
D) Customer perspective
Answer: A
Diff: 1
Terms: total quality management (TQM)
Objective: 1
AACSB: Reflective thinking

2) In general, profit potential ______ with greater competition, stronger potential entrants, products that are similar, and more-demanding customers and suppliers.
A) increases
B) stays constant
C) decreases
D) increases exponentially
Answer: C
Diff: 1
Terms: five force industry analysis
Objective: 1
AACSB: Reflective thinking

3) Which of the following is NOT a force that shapes an organization’s profit potential?
A) Competitors
B) Equivalent products
C) Bargaining power of input suppliers
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: five force industry analysis
Objective: 1
AACSB: Reflective thinking
4) Which of the following is a force that shapes an organization's profit potential?
A) Investors
B) Potential entrants into the market
C) Creditors
D) Research and development
Answer: B
Diff: 2
Terms: five force industry analysis
Objective: 1
AACSB: Reflective thinking

5) ______ is an organization's ability to offer products or services that are perceived by its customers as being superior and unique relative to those of its competitors.
A) Strategy
B) Product differentiation
C) Cost leadership
D) The balanced scorecard
Answer: B
Diff: 1
Terms: product differentiation
Objective: 1
AACSB: Reflective thinking

6) ______ is an organization's ability to achieve low costs relative to competitors through productivity and efficiency improvements, elimination of waste, and tight cost control.
A) Strategy
B) Product differentiation
C) Cost leadership
D) The balanced scorecard
Answer: C
Diff: 1
Terms: cost leadership
Objective: 1
AACSB: Reflective thinking

7) An organization that is using the product differentiation approach would:
A) focus on tight cost control
B) carefully cultivate their brands
C) provide products that are similar to competitors
D) offer products at a lower cost than competitors
Answer: B
Diff: 2
Terms: product differentiation
Objective: 1
AACSB: Reflective thinking
8) An organization that is using the cost leadership approach would:
A) incur costs for innovative R&D
B) provide products at a higher cost than competitors
C) focus on productivity through efficiency improvements
D) bring products to market rapidly
Answer: C
Diff: 2
Terms: cost leadership
Objective: 1
AACSB: Reflective thinking

Answer the following questions using the information below:

Stewart Corporation plans to grow by offering a sound system, the SS3000, that is superior and unique from the competition. Stewart believes that putting additional resources into R&D and staying ahead of the competition with technological innovations is critical to implementing its strategy.

9) Stewart's strategy is:
A) product differentiation
B) downsizing
C) reengineering
D) cost leadership
Answer: A
Diff: 2
Terms: product differentiation
Objective: 1
AACSB: Reflective thinking

Answer the following questions using the information below:

Riter Corporation manufactures water toys. It plans to grow by producing high-quality water toys at a low cost that are delivered in a timely manner. There are a number of other manufacturers who produce similar water toys. Riter believes that continuously improving its manufacturing processes and having satisfied employees are critical to implementing its strategy.

10) Riter's strategy is:
A) product differentiation
B) downsizing
C) reengineering
D) cost leadership
Answer: D
Diff: 2
Terms: cost leadership
Objective: 1
AACSB: Ethical reasoning
Answer the following questions using the information below:

Meale Company makes a household appliance with model number X500. The goal for 2012 is to reduce direct materials usage per unit. No defective units are currently produced. Manufacturing conversion costs depend on production capacity defined in terms of X500 units that can be produced. The industry market size for appliances increased 10% from 2011 to 2012. The following additional data are available for 2011 and 2012:

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units of X500 produced and sold</td>
<td>10,000</td>
<td>11,000</td>
</tr>
<tr>
<td>Selling price</td>
<td>$100</td>
<td>$95</td>
</tr>
<tr>
<td>Direct materials (square feet)</td>
<td>30,000</td>
<td>29,000</td>
</tr>
<tr>
<td>Direct material costs per square foot</td>
<td>$10</td>
<td>$11</td>
</tr>
<tr>
<td>Manufacturing capacity for X500 (units)</td>
<td>12,500</td>
<td>12,000</td>
</tr>
<tr>
<td>Total conversion costs</td>
<td>$250,000</td>
<td>$240,000</td>
</tr>
<tr>
<td>Conversion costs per unit of capacity</td>
<td>$20</td>
<td>$20</td>
</tr>
</tbody>
</table>

11) Which strategy is Meale's Corporation pursuing?
A) Product differentiation, because the units produced and sold increased.
B) Product differentiation, because total conversion costs decreased.
C) Cost leadership, because direct material costs per square foot increased.
D) Cost leadership, because the selling price decreased.
Answer: D
Diff: 2
Terms: cost leadership
Objective: 1
AACSB: Analytical skills

12) Strategy describes how an organization matches its own capabilities with the opportunities in the marketplace to accomplish its overall objectives.
Answer: TRUE
Diff: 1
Terms: total quality management (TQM)
Objective: 1
AACSB: Reflective thinking

13) One of the five forces of industry analysis is understanding the bargaining power of your input suppliers.
Answer: TRUE
Diff: 1
Terms: five force industry analysis
Objective: 1
AACSB: Reflective thinking
14) Product differentiation is an organization’s ability to achieve lower costs relative to competitors through productivity and efficiency improvements, elimination of waste, and tight cost control.
Answer: FALSE
Explanation: Cost leadership is an organization's ability to achieve lower costs relative to competitors through productivity and efficiency improvements, elimination of waste, and tight cost control.
Diff: 1
Terms: cost leadership
Objective: 1
AACSB: Reflective thinking

15) Product differentiation is an organization’s ability to offer products or services perceived by its customers to be superior and unique relative to the products or services of its competitors.
Answer: TRUE
Diff: 1
Terms: product differentiation
Objective: 1
AACSB: Reflective thinking

16) The cost leadership strategy is for products and services that are similar to competitor's products and services.
Answer: TRUE
Diff: 1
Terms: cost leadership
Objective: 1
AACSB: Reflective thinking

17) The product differentiation strategy is probably best for a company if the engineering staff is more skilled at making process improvements than at creatively designing new products.
Answer: FALSE
Explanation: The cost leadership strategy is probably best for a company if the engineering staff is more skilled at making process improvements than at creatively designing new products.
Diff: 2
Terms: product differentiation
Objective: 1
AACSB: Reflective thinking

18) In general, profit potential increases with greater competition, stronger potential entrants, products that are similar, and tougher customers and suppliers.
Answer: FALSE
Explanation: In general, profit potential decreases with greater competition, stronger potential entrants, products that are similar, and tougher customers and suppliers.
Diff: 1
Terms: five force industry analysis
Objective: 1
AACSB: Reflective thinking
19) Bosely Corporation is reviewing its business strategy. The first step for Bosely is to perform an industry analysis. You have been hired to help the company go through the strategy formulation process.

**Required:**
To perform the industry analysis, what areas should Bosely focus on and give at least one example of how Bosely can effectively deal with each area.

Answer: The industry analysis is composed of five areas:
1. Competitors - How competitive is the industry for Bosely's particular product? They can differentiate the product to reduce competition.
2. Potential entrants to the market - How easy is it for new competitors to join the market? Create barriers to entry, such as high capital requirements.
5. Bargaining power of input suppliers - How many raw material vendors are there? Try to find alternative suppliers and negotiate the best price for raw materials.

Diff: 3
Terms: five force industry analysis
Objective: 1
AACSB: Reflective thinking

20) Explain the product differentiation and the cost leadership strategies.

Answer: Product differentiation is an organization's ability to offer products or services perceived by its customers to be superior and unique relative to the products or services of its competitors.

Cost leadership is an organization's ability to achieve lower costs relative to competitors through productivity and efficiency improvements, elimination of waste, and tight cost control.

Diff: 3
Terms: cost leadership, product differentiation
Objective: 1
AACSB: Reflective thinking

Objective 13.2

1) ________ is the fundamental rethinking and redesign of business processes to achieve improvements in critical measures of performance such as cost, quality, service, speed, and customer satisfaction.

A) Strategy
B) Customer perspective
C) Learning and growth perspective
D) Reengineering

Answer: D
Diff: 1
Terms: reengineering
Objective: 2
AACSB: Reflective thinking
2) Successful reengineering involves:
A) cutting across functional lines to focus on the entire business process
B) redefining the roles and responsibilities of employees
C) using information technology
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: reengineering
Objective: 2
AACSB: Reflective thinking

3) The balanced scorecard measures an organization's performance from all of the following perspectives EXCEPT:
A) financial
B) government
C) customer
D) learning and growth
Answer: B
Diff: 2
Terms: Balanced Scorecard
Objective: 2
AACSB: Reflective thinking

4) Reengineering is the fundamental rethinking and redesign of business processes to achieve improvements in critical measures of performance such as cost, quality, service, speed, and customer satisfaction.
Answer: TRUE
Diff: 1
Terms: reengineering
Objective: 2
AACSB: Reflective thinking

5) Reengineering benefits are most significant when they focus on one business function rather than crossing functional lines of the business process.
Answer: FALSE
Explanation: Reengineering benefits are most significant when they cut across functional lines to focus on the entire business process.
Diff: 2
Terms: reengineering
Objective: 2
AACSB: Reflective thinking

6) Successful reengineering efforts generally involve changing the roles and responsibilities of employees.
Answer: TRUE
Diff: 2
Terms: reengineering
Objective: 2
AACSB: Reflective thinking
7) What is reengineering. Can you contrast a reengineering approach to change with a kaizen approach to change?
Answer: Reengineering is the rethinking of business processes, such as the order delivery process, to improve critical performance measures such as cost, quality, or customer satisfaction. It can be contrasted to a kaizen approach to change in that reengineering is most often a sudden, drastic change, while a kaizen approach involves small, incremental but continual improvements.
Diff: 2
Terms: reengineering
Objective: 2
AACSB: Analytical skills

Objective 13.3

1) _______ translates an organization's mission and strategy into a comprehensive set of performance measures that provide the framework for implementing its strategy.
A) Productivity component
B) Product differentiation
C) Cost leadership
D) The balanced scorecard
Answer: D
Diff: 1
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

2) The purpose of the balanced scorecard is best described as helping an organization:
A) develop customer relations
B) mobilize employee skills for continuous improvements in processing capabilities, quality, and response times
C) introduce innovative products and services desired by target customers
D) translate an organization's mission and strategy into a set of performance measures that help to implement the strategy
Answer: D
Diff: 3
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

3) The first step to successful balanced scorecard implementation is clarifying the:
A) organization's vision and strategy
B) elements that pertain to value-added aspects of the business
C) owner's expectations about return on investment
D) objectives of all four balanced scorecard measurement perspectives
Answer: A
Diff: 3
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking
4) The balanced scorecard is said to be "balanced" because it measures:
A) short-term and long-term objectives
B) financial and nonfinancial objectives
C) internal and external objectives
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

5) Balanced scorecard objectives are in balance when:
A) debits equal credits
B) financial performance measurements are less than the majority of measurements
C) the measurements are fair
D) the measurements reflect an improvement over the previous year
Answer: B
Diff: 3
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

6) The internal business processes perspective of the balanced scorecard comprises three subprocesses that address all of the following EXCEPT:
A) innovative processes used to create new products, services, and processes
B) motivating current employees
C) providing service and support to the customer after the sale
D) delivering existing products and services to best meet the needs of customers
Answer: B
Diff: 3
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

7) Identify the best description of the balanced scorecard's financial perspective. To achieve our firm's vision and strategy:
A) how can we obtain greater profits for the current year?
B) how can we increase shareholder value?
C) how will we obtain continuous improvements?
D) how can we secure greater customer satisfaction?
Answer: B
Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking
8) Identify the best description of the balanced scorecard's internal business processes perspective. To achieve our firm's vision and strategy:
A) how do we lower costs?
B) how do we motivate employees?
C) how can we obtain greater profits?
D) what processes will increase value to customers?
Answer: D
Diff: 3
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

9) All of the following relate to the balanced scorecard's learning and growth perspective EXCEPT:
A) How do we achieve greater employee satisfaction?
B) What new products do we create?
C) How do we provide information systems with updated technology?
D) How will we motivate and empower our employees?
Answer: B
Diff: 3
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

10) Measures of the balanced scorecard's financial perspective include:
A) information system availability
B) number of new patents
C) revenue growth
D) defect rates
Answer: C
Diff: 3
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

11) Measures of the balanced scorecard's financial perspective include all of the following EXCEPT:
A) operating income
B) customer satisfaction
C) gross profit percentage
D) cost reductions
Answer: B
Diff: 3
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking
12) Measures of the balanced scorecard's customer perspective include:
A) market share
B) number of on-time deliveries
C) number of process improvements
D) revenue growth
Answer: A
Diff: 3
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

13) Measures of the balanced scorecard's customer perspective include all of the following EXCEPT:
A) market share
B) customer satisfaction
C) number of new customers
D) customer training on new products
Answer: D
Diff: 3
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

14) Measures of the balanced scorecard's internal-business-process perspective include:
A) market share
B) new product development time
C) employee education
D) return on investment
Answer: B
Diff: 3
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

15) Measures of the balanced scorecard's internal-business-process perspective include all of the following EXCEPT:
A) operating capabilities
B) number of new products
C) employee turnover rates
D) defect rates
Answer: C
Diff: 3
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking
16) Measures of the balanced scorecard's learning-and-growth perspective include:
A) employee satisfaction ratings
B) economic value added
C) time taken to deliver product to customers
D) customer-retention percentage
Answer: A
Diff: 3
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

17) Measures of the balanced scorecard's learning-and-growth perspective include all of the following EXCEPT:
A) employee education and skill level
B) percentage of processes with advanced controls
C) employee-satisfaction ratings
D) time taken to deliver product to customers
Answer: D
Diff: 3
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

18) Which of the following is NOT true of a good balanced scorecard?
A) It tells the story of a company's strategy by articulating a sequence of cause-and-effect relationships.
B) It helps to communicate corporate strategy to all members of the organization.
C) It identifies all measures, whether significant or small, that help to implement strategy.
D) It uses nonfinancial measures to serve as leading indicators of future financial performance.
Answer: C
Diff: 3
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

19) Which of the following is NOT true of the balanced scorecard?
A) Different strategies call for different scorecards.
B) Successful implementation requires commitment and leadership from top management.
C) Only objective measures should be used and subjective measures should be avoided.
D) Cause-and-effect linkages may not be precise and should evolve over time.
Answer: C
Diff: 3
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking
20) The return-on-investment ratio is an example of a balanced-scorecard measure of the:
A) internal business process perspective
B) customer perspective
C) learning and growth perspective
D) financial perspective
Answer: D
Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

21) The number of complaints about a product is an example of a balanced-scorecard measure of the:
A) internal business process perspective
B) customer perspective
C) learning and growth perspective
D) financial perspective
Answer: B
Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Communication

22) Manufacturing cycle efficiency is an example of a balanced-scorecard measure of the:
A) internal business process perspective
B) customer perspective
C) learning and growth perspective
D) financial perspective
Answer: A
Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

23) Surveys of employee satisfaction is an example of a balanced-scorecard measure of the:
A) internal business process perspective
B) customer perspective
C) learning and growth perspective
D) financial perspective
Answer: C
Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Communication
Answer the following questions using the information below:

Stewart Corporation plans to grow by offering a sound system, the SS3000, that is superior and unique from the competition. Stewart believes that putting additional resources into R&D and staying ahead of the competition with technological innovations is critical to implementing its strategy.

24) To further company strategy, measures on the balanced scorecard would most likely include:
A) number of process improvements
B) manufacturing quality
C) yield
D) an increase in operating income from productivity gains
Answer:  B
Diff: 3
Terms:  Balanced Scorecard
Objective:  3
AACSB:  Reflective thinking

Answer the following questions using the information below:

Riter Corporation manufactures water toys. It plans to grow by producing high-quality water toys at a low cost that are delivered in a timely manner. There are a number of other manufacturers who produce similar water toys. Riter believes that continuously improving its manufacturing processes and having satisfied employees are critical to implementing its strategy.

25) To further company strategy, measures on the balanced scorecard would most likely include:
A) number of process improvements
B) price premium earned
C) longer cycle times
D) an increase in operating income from increased profit margins
Answer:  A
Diff: 3
Terms:  Balanced Scorecard
Objective:  3
AACSB:  Reflective thinking

26) Managers need to evaluate the success of a strategy by:
A) evaluating budget-to-actual variances
B) doing a cost-benefit analysis
C) linking the sources of operating-income increases to the strategy
D) evaluating the level of bonus compensation
Answer:  C
Diff: 3
Terms:  total quality management (TQM)
Objective:  3
AACSB:  Reflective thinking
27) The balanced scorecard translates an organization's mission and strategy into a set of performance measures that provides the framework for implementing its strategy.
Answer: TRUE
Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

Answer: TRUE
Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

29) In for-profit companies, the primary goal of the balanced scorecard is to sustain short-run financial performance.
Answer: FALSE
Explanation: In for-profit companies, the primary goal of the balanced scorecard is to sustain long-run financial performance.
Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

30) To achieve success, it is important to set nonfinancial objectives as well as financial objectives.
Answer: TRUE
Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

31) A strategy map is a diagram that describes how an organization creates value by connecting strategic objectives in explicit cause-and-effect relationships with each other in the financial, customer, internal business process, and learning and growth perspectives.
Answer: TRUE
Diff: 2
Terms: strategy map
Objective: 3
AACSB: Reflective thinking

32) The customer perspective of the balanced scorecard evaluates the profitability of the strategy.
Answer: FALSE
Explanation: The financial perspective of the balanced scorecard evaluates the profitability of the strategy.
Diff: 1
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking
33) Employee satisfaction is a measure of the internal business perspective of the balanced scorecard.
Answer: FALSE
Explanation: Employee satisfaction is a measure of the learning and growth perspective.
Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Communication

34) The financial perspective of the balanced scorecard identifies targeted customers and market segments and measures the company's success in these segments.
Answer: FALSE
Explanation: The customer perspective of the balanced scorecard identifies targeted customers and market segments and measures the company's success in these segments.
Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Communication

35) The customer perspective under the balanced scorecard approach would include measures on cost reduction.
Answer: FALSE
Explanation: The financial perspective under the balanced scorecard approach would include measures on cost reduction.
Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

36) When implementing a balanced scorecard, the cause-and-effect linkages are always precise.
Answer: FALSE
Explanation: When implementing a balanced scorecard, the cause-and-effect linkages are seldom precise.
Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking

37) Different strategies call for different scorecards.
Answer: TRUE
Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking
38) Buck Corporation plans to grow by offering a computer monitor, the CM3000 that is superior and unique from the competition. Buck believes that putting additional resources into R&D and staying ahead of the competition with technological innovations are critical to implementing its strategy.

**Required:**

a. Is Buck's strategy one of product differentiation or cost leadership? Explain briefly.

Identify at least one key element that you would expect to see included in the balanced scorecard:

b. for the financial perspective.

c. for the customer perspective.

d. for the internal business process perspective.

e. for the learning and growth perspective.

**Answer:**

a. Buck's strategy is one of product differentiation because the company plans to offer a product that is superior and unique from the competition.

The company's balanced scorecard should describe the product differentiation strategy. Key elements should include:

b. operating income growth from charging higher margins for CM3000 for the financial perspective

c. market share in the high-end monitor market, customer satisfaction, and new customers for the customer perspective

d. manufacturing quality, new product features added, and order delivery time for the internal business perspective

e. development time for new features, improvements in manufacturing technologies, employee education and skill levels, and employee satisfaction for the learning and growth perspective

**Diff:** 2

**Terms:** cost leadership, product differentiation, balanced scorecard

**Objective:** 1, 3

**AACSB:** Use of Information Technology
39) Maloney Corporation manufactures plastic water bottles. It plans to grow by producing high-quality water bottles at a low cost that are delivered in a timely manner. There are a number of other manufacturers who produce similar water bottles. Maloney believes that continuously improving its manufacturing processes and having satisfied employees are critical to implementing its strategy.

**Required:**

a. Is Maloney's strategy one of product differentiation or cost leadership? Explain briefly.

Identify at least one key element that you would expect to see included in the balanced scorecard:

b. for the financial perspective.

c. for the customer perspective.

d. for the internal business process perspective.

e. for the learning and growth perspective.

**Answer:**

a. Maloney’s strategy is one of cost leadership because there are a number of other manufacturers who produce similar water bottles. To succeed, Maloney will have to achieve lower costs relative to competitors through productivity and efficiency improvements, elimination of waste, and tight cost controls.

The company's balanced scorecard should describe the product differentiation strategy. Key elements should include:

b. operating income growth from productivity gains and growth for the financial perspective

c. growth in market share, new customers, customer responsiveness, and customer satisfaction for the customer perspective

d. yield, time to complete customer jobs, and order delivery time for the internal business perspective

e. number of process improvements, hours of employee training, and employee satisfaction for the learning and growth perspective

**Diff:** 2

**Terms:** cost leadership, product differentiation, balanced scorecard

**Objective:** 1, 3

**AACSB:** Analytical skills
40) For each of the following measures, identify which perspective of the balanced scorecard it represents: financial, customer, internal-business-process, or learning-and growth.

1. service response time  
2. market share  
3. gross margin percentage  
4. defect rates  
5. customer satisfaction  
6. information system availability  
7. new-product development time  
8. economic value added  
9. employee education  
10. manufacturing downtime

Answer:
1. internal-business-process  
2. customer  
3. financial  
4. internal-business-process  
5. customer  
6. learning-and-growth  
7. internal-business-process  
8. financial  
9. learning-and-growth  
10. internal-business-process

Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Analytical skills

41) What is the primary purpose of the balanced scorecard?

Answer: The primary purpose of the balanced scorecard is to translate an organization's mission and strategy into a set of performance measures that put that strategy into action with clearly-stated objectives, measures, targets, and initiatives.

Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Analytical skills

42) What are the four key perspectives in the balanced scorecard?

Answer: The four key perspectives in the balanced scorecard are:

a. the financial perspective,  
b. the customer perspective,  
c. the internal business processes perspective, and  
d. the learning and growth perspective.

Diff: 2
Terms: Balanced Scorecard
Objective: 3
AACSB: Reflective thinking
Objective 13.4

1) Which component of strategy measures the changes in operating income attributed solely to an increase in the quantity of output between Year 1 and Year 2?
   A) the growth component  
   B) the price-recovery component  
   C) the productivity component  
   D) the cost leadership component  
   Answer:  A  
   Diff: 1  
   Terms:  growth component  
   Objective:  4  
   AACSB:  Reflective thinking

2) Which component of strategy measures the change in operating income attributable solely to changes in a company's profit margins between Year 1 and Year 2?
   A) the growth component  
   B) the price-recovery component  
   C) the productivity component  
   D) the cost leadership component  
   Answer:  B  
   Diff: 1  
   Terms:  price-recovery component  
   Objective:  4  
   AACSB:  Reflective thinking

3) Which component of strategy measures the reduction in costs attributable to a reduction in the quantity of inputs used in Year 2 relative to the quantity of inputs that would have been used in Year 1 to produce the Year 2 output?
   A) the growth component  
   B) the price-recovery component  
   C) the productivity component  
   D) the cost leadership component  
   Answer:  C  
   Diff: 1  
   Terms:  productivity component  
   Objective:  4  
   AACSB:  Reflective thinking

4) When analyzing the change in operating income, the strategy component of growth:
   A) calculations are similar to the selling-price variance calculations  
   B) isolates the change attributed solely to an increase in market share  
   C) isolates the change attributed solely to an increase in industry growth  
   D) isolates the change attributed solely to an increase in the quantity of units sold  
   Answer:  D  
   Diff: 3  
   Terms:  growth component  
   Objective:  4  
   AACSB:  Reflective thinking
5) When analyzing the change in operating income, the strategy component of price-recovery:
A) calculations are similar to the efficiency-variance calculations
B) compares the change in output price with the changes in input prices
C) will report a large positive amount when a company has successfully pursued the cost leadership strategy
D) isolates the change attributed solely to an increase in production efficiencies
Answer: B
Diff: 3
Terms: price-recovery component
Objective: 4
AACSB: Reflective thinking

6) When analyzing the change in operating income, the strategy component of productivity:
A) calculations are similar to the sales-volume variance calculations
B) compares the change in output price with the changes in input prices
C) will report a large positive amount when a company has successfully pursued the cost leadership strategy
D) isolates the change attributed solely to an increase in the quantity of units sold
Answer: C
Diff: 3
Terms: productivity component
Objective: 4
AACSB: Reflective thinking

7) When analyzing the change in operating income, the strategy component of growth will increase when:
A) capacity is reduced
B) production efficiencies are successfully implemented
C) selling prices are increased
D) more units are sold
Answer: D
Diff: 3
Terms: growth component
Objective: 4
AACSB: Reflective thinking

8) When analyzing the change in operating income, the strategy component of price-recovery will increase when:
A) capacity is reduced
B) production efficiencies are successfully implemented
C) selling prices are increased
D) more units are sold
Answer: C
Diff: 3
Terms: price-recovery component
Objective: 4
AACSB: Reflective thinking
9) When analyzing the change in operating income, the strategy component of productivity will increase when:
A) capacity is reduced
B) quality is enhanced
C) selling prices are increased
D) more units are produced and sold
Answer: A
Diff: 3
Terms: productivity component
Objective: 4
AACSB: Reflective thinking

10) Successful implementation of a cost leadership strategy will result in:
A) large favorable growth and price-recovery components
B) large favorable price-recovery and productivity components
C) large favorable productivity and growth components
D) only a large favorable growth component
Answer: C
Diff: 3
Terms: productivity component, growth component, cost leadership
Objective: 4
AACSB: Reflective thinking

11) Successful implementation of a product differentiation strategy will result in:
A) a large favorable growth and price-recovery components
B) a large favorable price-recovery and productivity components
C) a large favorable productivity and growth components
D) only a large favorable growth component
Answer: A
Diff: 3
Terms: growth component, price-recovery component, product differentiation
Objective: 4
AACSB: Reflective thinking

12) The revenue effect of growth is calculated by multiplying the difference in units sold (current year minus the previous year) by ________.
A) selling price in the current year
B) selling price in the previous year
C) gross profit in the previous year
D) gross profit in the current year
Answer: B
Diff: 3
Terms: growth component
Objective: 4
AACSB: Reflective thinking
13) The revenue effect of price recovery is calculated by multiplying the difference in selling price (current year minus the previous year) by _____.
A) actual units sold in the current year
B) budgeted units sold in the previous year
C) budgeted units sold in the current year
D) actual units sold in the previous year
Answer: A
Diff: 3
Terms: growth component, price-recovery component, productivity component
Objective: 4
AACSB: Reflective thinking

14) An operating income analysis of Paul Reynolds Incorporated revealed the following:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating income for 2012</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Add growth component</td>
<td>75,000</td>
</tr>
<tr>
<td>Deduct price-recovery component</td>
<td>(45,000)</td>
</tr>
<tr>
<td>Add productivity component</td>
<td>60,000</td>
</tr>
<tr>
<td>Operating income for 2013</td>
<td>$1,590,000</td>
</tr>
</tbody>
</table>

Reynolds' operating income gain is consistent with the:
A) product differentiation strategy
B) downsizing strategy
C) reengineering strategy
D) cost leadership strategy
Answer: D
Diff: 2
Terms: cost leadership; growth, price-recovery, productivity component
Objective: 4
AACSB: Reflective thinking

15) An operating income analysis of Deb Nunn Incorporated revealed the following:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating income for 2012</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Add growth component</td>
<td>45,000</td>
</tr>
<tr>
<td>Add price-recovery component</td>
<td>200,000</td>
</tr>
<tr>
<td>Deduct productivity component</td>
<td>(24,000)</td>
</tr>
<tr>
<td>Operating income for 2013</td>
<td>$1,721,000</td>
</tr>
</tbody>
</table>

Nunn's operating income gain is consistent with the:
A) product differentiation strategy
B) downsizing strategy
C) reengineering strategy
D) cost leadership strategy
Answer: A
Diff: 2
Terms: product diff; growth, price-recovery, and productivity component
Objective: 4
AACSB: Reflective thinking
Answer the following questions using the information below:

Meale Company makes a household appliance with model number X500. The goal for 2012 is to reduce direct materials usage per unit. No defective units are currently produced. Manufacturing conversion costs depend on production capacity defined in terms of X500 units that can be produced. The industry market size for appliances increased 10% from 2011 to 2012. The following additional data are available for 2011 and 2012:

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units of X500 produced and sold</td>
<td>10,000</td>
<td>11,000</td>
</tr>
<tr>
<td>Selling price</td>
<td>$100</td>
<td>$95</td>
</tr>
<tr>
<td>Direct materials (square feet)</td>
<td>30,000</td>
<td>29,000</td>
</tr>
<tr>
<td>Direct material costs per square foot</td>
<td>$10</td>
<td>$11</td>
</tr>
<tr>
<td>Manufacturing capacity for X500 (units)</td>
<td>12,500</td>
<td>12,000</td>
</tr>
<tr>
<td>Total conversion costs</td>
<td>$250,000</td>
<td>$240,000</td>
</tr>
<tr>
<td>Conversion costs per unit of capacity</td>
<td>$20</td>
<td>$20</td>
</tr>
</tbody>
</table>

16) What is operating income for 2011?
A) $450,000  
B) $1,000,000  
C) $750,000  
D) $700,000  
Answer: A  
Explanation: A) ($100 × 10,000) - [($10 × 30,000) + ($20 × 12,500)] = $450,000  
Diff: 2  
Terms: operating income  
Objective: 4  
AACSB: Analytical skills

17) What is operating income for 2012?
A) $1,045,000  
B) $726,000  
C) $486,000  
D) $476,000  
Answer: C  
Explanation: C) ($95 × 11,000) - [($11 × 29,000) + ($20 × 12,000)] = $486,000  
Diff: 2  
Terms: operating income  
Objective: 4  
AACSB: Analytical skills
18) Overall, was Meale's strategy successful in 2012?
A) No, because the selling price per unit decreased.
B) Yes, because operating income increased.
C) Yes, because less direct materials were used.
D) No, because more units were produced and sold.
Answer: B
Explanation: B) ($100 × 10,000) - [(10 × 30,000) + (20 × 12,500)] = $450,000
($95 × 11,000) - [(11 × 29,000) + (20 × 12,000)] = $486,000
$486,000- $450,000 = 36,000 F
Diff: 3
Terms: cost leadership
Objective: 4
AACSB: Analytical skills

Answer the following questions using the information below:

Merrill Company makes a household appliance with model number X800. The goal for 2012 is to reduce direct materials usage per unit. No defective units are currently produced. Manufacturing conversion costs depend on production capacity defined in terms of X800 units that can be produced. The industry market size for appliances increased 5% from 2011 to 2012. The following additional data are available for 2011 and 2012:

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units of X800 produced and sold</td>
<td>10,000</td>
<td>10,500</td>
</tr>
<tr>
<td>Selling price</td>
<td>$100</td>
<td>$95</td>
</tr>
<tr>
<td>Direct materials (square feet)</td>
<td>30,000</td>
<td>29,000</td>
</tr>
<tr>
<td>Direct material costs per square foot</td>
<td>$10</td>
<td>$11</td>
</tr>
<tr>
<td>Manufacturing capacity for X800 (units)</td>
<td>12,500</td>
<td>12,000</td>
</tr>
<tr>
<td>Total conversion costs</td>
<td>$250,000</td>
<td>$240,000</td>
</tr>
<tr>
<td>Conversion costs per unit of capacity</td>
<td>$20</td>
<td>$20</td>
</tr>
</tbody>
</table>

19) What is the revenue effect of the growth component?
A) $2,500 U
B) $52,500 U
C) $47,500 F
D) $50,000 F
Answer: D
Explanation: D) (10,500 - 10,000) × $100 = $50,000 F
Diff: 2
Terms: growth component
Objective: 4
AACSB: Analytical skills
20) What is the cost effect of the growth component for direct materials?
A) $15,000 U
B) $10,000 U
C) $10,000 F
D) $16,500 F
Answer: A
Explanation: A) 30,000/10,000 units = 3 sq feet per unit
500 additional units x 3sq feet = 1,500 additional square feet
1,500 additional sq feet x $10 per sq ft = $15,000 U
OR
30,000 × 10,500/10,000 = 31,500; (31,500 - 30,000) × $10 = $15,000 U
Diff: 3
Terms: growth component
Objective: 4
AACSB: Analytical skills

21) What is the cost effect of the growth component for conversion costs?
A) $12,500 U
B) Zero
C) $10,000 U
D) $10,000 F
Answer: D
Diff: 3
Terms: growth component
Objective: 4
AACSB: Analytical skills

22) Overall, was Merrill's strategy successful in 2012?
A) No, because the selling price per unit decreased.
B) No, because operating income decreased.
C) Yes, because less direct materials were used.
D) No, because more units were produced and sold.
Answer: B
Diff: 3
Terms: growth component
Objective: 4
AACSB: Analytical skills
Answer the following questions using the information below:

Wingard Company makes a household appliance with model number X200. The goal for 2012 is to reduce direct materials usage per unit. No defective units are currently produced. Manufacturing conversion costs depend on production capacity defined in terms of X200 units that can be produced. The industry market size for appliances increased 10% from 2011 to 2012. The following additional data are available for 2011 and 2012:

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units of X200 produced and sold</td>
<td>10,000</td>
<td>11,000</td>
</tr>
<tr>
<td>Selling price</td>
<td>$100</td>
<td>$95</td>
</tr>
<tr>
<td>Direct materials (square feet)</td>
<td>30,000</td>
<td>29,000</td>
</tr>
<tr>
<td>Direct material costs per square foot</td>
<td>$10</td>
<td>$11</td>
</tr>
<tr>
<td>Manufacturing capacity for X200 (units)</td>
<td>12,500</td>
<td>11,000</td>
</tr>
<tr>
<td>Total manufacturing conversion costs</td>
<td>$250,000</td>
<td>$220,000</td>
</tr>
<tr>
<td>Manufacturing conversion costs per unit of capacity</td>
<td>$20</td>
<td>$20</td>
</tr>
</tbody>
</table>

23) What is the revenue effect of the price-recovery component?
A) $5,000 U
B) $55,000 U
C) $50,000 F
D) $102,500 F
Answer: B
Explanation: B) ($95 - $100) × 11,000 = $55,000 U
Diff: 2
Terms: price-recovery component
Objective: 4
AACSB: Analytical skills

24) What is the cost effect of the price-recovery component?
A) $30,500 F
B) $31,500 U
C) $2,500 F
D) $33,000 U
Answer: D
Explanation: D) 30,000 × 11,000/10,000 = 33,000;
[(11 - 10) × 33,000] + [(20 - 20) × 12,500] = $33,000 U
Diff: 3
Terms: price-recovery component
Objective: 4
AACSB: Analytical skills
25) What is the net effect on operating income as a result of the price-recovery component?
A) decreased operating income due to decreased selling price and inability to recover increased costs
B) decreased operating income due to the inability to recover increased costs
C) increased operating income due to the increased number of units produced and sold
D) increased operating income due to the revenue effect of the price-recovery component

Answer: A

Explanation: A) $(95 - 100) \times 11,000 = 55,000 U$
$30,000 \times 11,000/10,000 = 33,000;$
$[ (11 - 10) \times 33,000 ] + [ (20 - 20) \times 12,500 ] = 33,000 U$
$55,000 U + 33,000 U = 88,000 U decrease in operating income as a result of the price recovery component

Diff: 3

Terms: price-recovery component
Objective: 4
AACSB: Analytical skills

26) Overall, was Wingard's strategy successful for 2012?
A) No, because the selling price per unit decreased.
B) Yes, because operating income increased.
C) Yes, because less direct materials were used.
D) No, because more units were produced and sold.

Answer: B

Diff: 3

Terms: productivity component
Objective: 4
AACSB: Analytical skills
Answer the following questions using the information below:

Following a strategy of product differentiation, Loftus Company makes a high-end Appliance, AP15. Loftus Company presents the following data for the years 2011 and 2012:

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units of AP15 produced and sold</td>
<td>20,000</td>
<td>21,000</td>
</tr>
<tr>
<td>Selling price</td>
<td>$200</td>
<td>$220</td>
</tr>
<tr>
<td>Direct materials (square feet)</td>
<td>60,000</td>
<td>61,500</td>
</tr>
<tr>
<td>Direct materials costs per square foot</td>
<td>$20</td>
<td>$22</td>
</tr>
<tr>
<td>Manufacturing capacity in units of AP15</td>
<td>25,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Total conversion costs</td>
<td>$1,000,000</td>
<td>$1,100,000</td>
</tr>
<tr>
<td>Conversion costs per unit of capacity</td>
<td>$40</td>
<td>$44</td>
</tr>
<tr>
<td>Selling and customer-service capacity (customers)</td>
<td>60</td>
<td>58</td>
</tr>
<tr>
<td>Total selling and customer-service costs</td>
<td>$360,000</td>
<td>$362,500</td>
</tr>
<tr>
<td>Selling and customer-service capacity cost per customer</td>
<td>$6,000</td>
<td>$6,250</td>
</tr>
</tbody>
</table>

Loftus Company produces no defective units but it wants to reduce direct materials usage per unit of AP15 in 2012. Manufacturing conversion costs in each year depend on production capacity defined in terms of AP15 units that can be produced. Selling and customer-service costs depend on the number of customers that the customer and service functions are designed to support. Loftus Company has 46 customers in 2011 and 50 customers in 2012. The industry market size for high-end appliances increased 5% from 2011 to 2012.

27) What is operating income for 2011?
A) $364,500
B) $1,804,500
C) $1,440,000
D) $200,000
Answer: C
Explanation: C) ($200 × 20,000) - [($20 × 60,000) + ($40 × 25,000) + ($6,000 × 60)] = $1,440,000
Diff: 2
Terms: operating income
Objective: 4
AACSB: Analytical skills

28) What is operating income in 2012?
A) $1,440,000
B) $1,804,500
C) $364,500
D) $200,000
Answer: B
Explanation: B) ($220 × 21,000) - [($22 × 61,500) + ($44 × 25,000) + ($6,250 × 58)] = $1,804,500
Diff: 2
Terms: operating income
Objective: 4
AACSB: Analytical skills
29) What is the change in operating income from 2011 to 2012?
A) $1,440,000 F  
B) $1,804,500 F  
C) $364,500 F  
D) $200,000 F
Answer:  C
Explanation:  C) ($200 × 20,000) - [($20 × 60,000) + ($40 × 25,000) + ($6,000 × 60)] = $1,440,000  
($220 × 21,000) - [($22 × 61,500) + ($44 × 25,000) + ($6,250 × 58)] = $1,804,500  
$1,440,000 - $1,804,500 = $364,500 F
Diff: 2
Terms:  operating income
Objective:  4
AACSB:  Analytical skills

30) What is the revenue effect of the growth component?
A) $220,000 F  
B) $420,000 F  
C) $400,000 F  
D) $200,000 F
Answer:  D
Explanation:  D) (21,000 - 20,000) × $200 = $200,000 F
Diff: 2
Terms:  growth component
Objective:  4
AACSB:  Analytical skills

31) What is the cost effect of the growth component?
A) $60,000 U  
B) $140,000 F  
C) $60,000 F  
D) $200,000 F
Answer:  A
Explanation:  A) [(63,000 - 60,000) × $20] + [(25,000 - 25,000) × $40] + [(60 - 60) × $6,000] = $60,000 U
Diff: 3
Terms:  growth component
Objective:  4
AACSB:  Analytical skills
32) What is the net effect on operating income as a result of the growth component?
A) $60,000 U
B) $140,000 F
C) $60,000 F
D) $200,000 F
Answer: B
Explanation: B) (21,000 - 20,000) × $200 = $200,000 F
[(63,000 - 60,000) × $20] + [(25,000 - 25,000) × $40] + [(60 - 60) × $6,000] = $60,000 U
$200,000 F + $60,000 U = $140,000 F
Diff: 3
Terms: growth component
Objective: 4
AACSB: Analytical skills

33) What is the revenue effect of the price-recovery component?
A) $220,000 F
B) $420,000 F
C) $400,000 F
D) $200,000 F
Answer: B
Explanation: B) ($220 - $200) × 21,000 = $420,000 F
Diff: 2
Terms: price-recovery component
Objective: 4
AACSB: Analytical skills

34) What is the cost effect of the price-recovery component?
A) $179,000 F
B) $179,000 U
C) $241,000 U
D) $420,000 F
Answer: C
Explanation: C) [($22 - $20) × 63,000] + [($44 - $40) × 25,000] + [($6,250 - $6,000) × 60] = $241,000 U
Diff: 3
Terms: price-recovery component
Objective: 4
AACSB: Analytical skills
35) What is the net effect on operating income as a result of the price-recovery component?
A) $179,000 F
B) $179,000 U
C) $241,000 U
D) $420,000 F
Answer: A
Explanation: A) $(220 - $200) × 21,000 = $420,000 F
[(22 - $20) × 63,000] + [(44 - $40) × 25,000] + [(6,250 - $6,000) × 60] = $241,000 U
$420,000 F + $241,000 U = $179,000 F
Diff: 3
Terms: price-recovery component
Objective: 4
AACSB: Analytical skills

36) What is the net effect on operating income as a result of the productivity component?
A) $179,000 F
B) $45,500 F
C) $241,000 U
D) $420,000 F
Answer: B
Explanation: B) [(61,500 - 63,000) × $22] + [(25,000 - 25,000) × $40] + [(58 - 60) × $6,250] = $45,500 F
Diff: 3
Terms: productivity component
Objective: 4
AACSB: Analytical skills

37) An analysis of Baker, Inc.’s operating income for the last two years showed the following:

<table>
<thead>
<tr>
<th>Operating income for 2011</th>
<th>$1,200,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add growth component</td>
<td>30,000</td>
</tr>
<tr>
<td>Add price-recovery component</td>
<td>200,000</td>
</tr>
<tr>
<td>Deduct productivity component</td>
<td>(16,000)</td>
</tr>
<tr>
<td>Operating income for 2012</td>
<td>$1,414,000</td>
</tr>
</tbody>
</table>

This gain in operating income is consistent with a:
A) downsizing strategy
B) reengineering strategy
C) product differentiation strategy
D) cost leadership strategy
Answer: C
Diff: 2
Terms: price-recovery component, growth component, productivity component
Objective: 4
AACSB: Analytical skills
38) An increase of operating income from one year to the next indicates a company's strategy was successful.
Answer: FALSE
Explanation: Operating income could have increased simply because the entire market expanded and have nothing to do with the implementation of a company's strategy.
Diff: 3
Terms: Balanced Scorecard
Objective: 4
AACSB: Reflective thinking

39) To evaluate the success of its strategy, a company can subdivide the change in operating income into growth, price-recovery, and productivity components.
Answer: TRUE
Diff: 2
Terms: growth component, price-recovery component, productivity component
Objective: 4
AACSB: Reflective thinking

40) The productivity component of operating income focuses exclusively on revenues.
Answer: FALSE
Explanation: The productivity component of operating income focuses exclusively on costs.
Diff: 2
Terms: productivity component
Objective: 4
AACSB: Reflective thinking

41) The price-recovery component measures the increase in operating income from selling more units of a product.
Answer: FALSE
Explanation: The growth component measures the increase in operating income from selling more units of a product.
Diff: 1
Terms: price-recovery component
Objective: 4
AACSB: Reflective thinking

42) Companies that have been successful at cost leadership will show large favorable price-recovery and growth components when analyzing profitability.
Answer: FALSE
Explanation: Companies that have successfully differentiated their products will show large favorable price-recovery and growth components when analyzing profitability.
Diff: 3
Terms: cost leadership, price-recovery component, growth component
Objective: 4
AACSB: Reflective thinking
43) The price-recovery component of a change in operating income from one year to the next measures the increase in operating income from selling more units of the product.
Answer: FALSE
Explanation: The growth component of a change in operating income from one year to the next measures the increase in operating income from selling more units of the product.
Diff: 2
Terms: price-recovery component
Objective: 4
AACSB: Reflective thinking

44) The growth component of a change in operating income measures the effect of price changes on revenues and costs.
Answer: FALSE
Explanation: The price-recovery component of a change in operating income measures the effect of price changes on revenues and costs.
Diff: 2
Terms: price-recovery component
Objective: 4
AACSB: Reflective thinking

45) An analysis of Rodney Corporation's operating income changes between 2011 and 2012 show the following:

<table>
<thead>
<tr>
<th>Operating income for 2011</th>
<th>$2,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add growth component</td>
<td>100,000</td>
</tr>
<tr>
<td>Deduct price-recovery component</td>
<td>(60,000)</td>
</tr>
<tr>
<td>Add productivity component</td>
<td>240,000</td>
</tr>
<tr>
<td>Operating income for 2012</td>
<td>$2,280,000</td>
</tr>
</tbody>
</table>

**Required:**
Is Rodney's operating income gain consistent with the product differentiation or cost leadership strategy? Explain briefly.
Answer: Rodney's operating income gain is consistent with the cost leadership strategy because the increase in operating income was driven by the $240,000 gain in productivity. It appears that Rodney took advantage of its productivity gain to reduce prices and to fuel growth.
Diff: 2
Terms: cost leadership, product differentiation
Objective: 1, 4
AACSB: Analytical skills
46) An analysis of Captain Jack Corporation's operating income changes between 2011 and 2012 show the following:

| Operating income for 2011 $2,000,000 |
| Add growth component 60,000 |
| Add price-recovery component 400,000 |
| Deduct productivity component (20,000) |
| Operating income for 2012 $2,440,000 |

**Required:**
Is Captain Jack's operating income gain consistent with the product differentiation or cost leadership strategy? Explain briefly.

**Answer:** Captain Jack's operating income gain is consistent with the product differentiation strategy because the increase in operating income was driven by the $400,000 gain in the price-recovery component. It appears that Jack's superior quality stimulated slight growth and allowed it to charge a price premium for its products.

Diff: 2
Terms: cost leadership, product differentiation
Objective: 1, 4
AACSB: Reflective thinking

47) Following a strategy of product differentiation, Sting Corporation makes a high-end computer monitor, CM7. Sting Corporation presents the following data for the years 2012 and 2013:

<table>
<thead>
<tr>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units of CM7 produced and sold</td>
<td>5,000</td>
</tr>
<tr>
<td>Selling price</td>
<td>$400</td>
</tr>
<tr>
<td>Direct materials (pounds)</td>
<td>15,000</td>
</tr>
<tr>
<td>Direct materials costs per pound</td>
<td>$40</td>
</tr>
<tr>
<td>Manufacturing capacity for CM7 (units)</td>
<td>10,000</td>
</tr>
<tr>
<td>Conversion costs</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Conversion costs per unit of capacity</td>
<td>$100</td>
</tr>
<tr>
<td>Selling and customer-service capacity (customers)</td>
<td>60</td>
</tr>
<tr>
<td>Total selling and customer-service costs</td>
<td>$360,000</td>
</tr>
<tr>
<td>Selling and customer-service capacity cost per customer</td>
<td>$6,000</td>
</tr>
</tbody>
</table>

Sting Corporation produces no defective units but it wants to reduce direct materials usage per unit of CM7 in 2013. Manufacturing conversion costs in each year depend on production capacity defined in terms of CM7 units that can be produced. Selling and customer-service costs depend on the number of customers that the customer and service functions are designed to support. Sting Corporation has 100 customers in 2012 and 115 customers in 2013. The industry market size for high-end computer monitors increased 5% from 2012 to 2013.

**Required:**

a. What is operating income for 2012?
b. What is operating income in 2013?
c. What is the change in operating income from 2012 to 2013?
Answer:
a. $(400 \times 5,000) - \left( (40 \times 15,000) + (100 \times 10,000) + (6,000 \times 60) \right) = $40,000

b. $(440 \times 5,500) - \left( (44 \times 15,375) + (110 \times 10,000) + (6,250 \times 58) \right) = $281,000

c. $40,000 - $281,000 = $241,000 \text{ F}

Diff: 2
Terms: operating income
Objective: 4
AACSB: Analytical skills

48) Following a strategy of product differentiation, Sting Corporation makes a high-end computer monitor, CM7. Sting Corporation presents the following data for the years 2012 and 2013:

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units of CM7 produced and sold</td>
<td>5,000</td>
<td>5,500</td>
</tr>
<tr>
<td>Selling price</td>
<td>$400</td>
<td>$440</td>
</tr>
<tr>
<td>Direct materials (pounds)</td>
<td>15,000</td>
<td>15,375</td>
</tr>
<tr>
<td>Direct materials costs per pound</td>
<td>$40</td>
<td>$44</td>
</tr>
<tr>
<td>Manufacturing capacity for CM7 (units)</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Conversion costs</td>
<td>$1,000,000</td>
<td>$1,100,000</td>
</tr>
<tr>
<td>Conversion costs per unit of capacity</td>
<td>$100</td>
<td>$110</td>
</tr>
<tr>
<td>Selling and customer-service capacity (customers)</td>
<td>60</td>
<td>58</td>
</tr>
<tr>
<td>Total selling and customer-service costs</td>
<td>$360,000</td>
<td>$362,500</td>
</tr>
<tr>
<td>Selling and customer-service capacity cost per customer</td>
<td>$6,000</td>
<td>$6,250</td>
</tr>
</tbody>
</table>

Sting Corporation produces no defective units but it wants to reduce direct materials usage per unit of CM7 in 2013. Manufacturing conversion costs in each year depend on production capacity defined in terms of CM7 units that can be produced. Selling and customer-service costs depend on the number of customers that the customer and service functions are designed to support. Ernsting Corporation has 100 customers in 2012 and 115 customers in 2013. The industry market size for high-end computer monitors increased 5% from 2012 to 2013.

Required:
a. What is the revenue effect of the growth component?
b. What is the cost effect of the growth component?
c. What is the net effect on operating income as a result of the growth component?

Answer:
a. $(5,500 - 5,000) \times $400 = $200,000 \text{ F}

b. $15,000 \times 5,500 / 5,000 = 16,500; \left( (16,500 - 15,000) \times 40 \right) + \left( (10,000 - 10,000) \times 100 \right) + \left( (60 - 60) \times 6,000 \right) = $60,000 \text{ U}

c. $200,000 \text{ F} + $60,000 \text{ U} = $140,000 \text{ F}

Diff: 3
Terms: growth component
Objective: 4
AACSB: Analytical skills
49) Following a strategy of product differentiation, Sting Corporation makes a high-end computer monitor, CM7. Sting Corporation presents the following data for the years 2012 and 2013:

<table>
<thead>
<tr>
<th></th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units of CM7 produced and sold</td>
<td>5,000</td>
<td>5,500</td>
</tr>
<tr>
<td>Selling price</td>
<td>$400</td>
<td>$440</td>
</tr>
<tr>
<td>Direct materials (pounds)</td>
<td>15,000</td>
<td>15,375</td>
</tr>
<tr>
<td>Direct materials costs per pound</td>
<td>$40</td>
<td>$44</td>
</tr>
<tr>
<td>Manufacturing capacity for CM12 (units)</td>
<td>10,000</td>
<td>10,000</td>
</tr>
<tr>
<td>Conversion costs</td>
<td>$1,000,000</td>
<td>$1,100,000</td>
</tr>
<tr>
<td>Conversion costs per unit of capacity</td>
<td>$100</td>
<td>$110</td>
</tr>
<tr>
<td>Selling and customer-service capacity (customers)</td>
<td>60</td>
<td>58</td>
</tr>
<tr>
<td>Total selling and customer-service costs</td>
<td>$360,000</td>
<td>$362,500</td>
</tr>
<tr>
<td>Selling and customer-service capacity cost per customer</td>
<td>$6,000</td>
<td>$6,250</td>
</tr>
</tbody>
</table>

Sting Corporation produces no defective units but it wants to reduce direct materials usage per unit of CM7 in 2012. Manufacturing conversion costs in each year depend on production capacity defined in terms of CM7 units that can be produced. Selling and customer-service costs depend on the number of customers that the customer and service functions are designed to support. Ernsting Corporation has 100 customers in 2012 and 115 customers in 2013. The industry market size for high-end computer monitors increased 5% from 2012 to 2013.

Required:

a. What is the revenue effect of the price-recovery component?

b. What is the cost effect of the price-recovery component?

c. What is the net effect on operating income as a result of the price-recovery component?

d. What is the net effect on operating income as a result of the productivity component?

Answer:

a. \( (\$440 - \$400) \times 5,500 = \$220,000 \text{ F} \)

b. \( 15,000 \times 5,500 / 5,000 = 16,500; \left( (\$44 - \$40) \times 16,500 \right) \) + \( (\$110 - \$100) \times 10,000 \) + \( (\$6,250 - \$6,000) \times 60 \) = \$181,000 \text{ U} \)

c. \$220,000 \text{ F} + \$181,000 \text{ U} = \$39,000 \text{ F} \)

d. \( 15,000 \times 5,500 / 5,000 = 16,500; \left( (15,375 - 16,500) \times \$44 \right) + \left( (10,000 - 10,000) \times \$110 \right) + \left( (58 - 60) \times 6,250 \right) = \$62,000 \text{ F} \)

Diff: 3

Terms: productivity component

Objective: 4

AACSB: Analytical skills
50) Describe three key components in performing a strategic analysis of operating income.
Answer: The three key components in performing a strategic analysis of operating income include:

a. the growth component, which measures the change in operating income attributable solely to an increase in the quantity of output sold from one year to the next.

b. the price-recovery component, which measures the change in operating income attributable solely to changes in the prices of the inputs and the outputs from one year to the next.

c. the productivity component, which measures the change in costs attributable to a change in the quantity of inputs used in the current year relative to the quantity of inputs that would have been used in the previous year to produce current year output.

Diff: 2
Terms: growth component, price-recovery component, productivity component
Objective: 4
AACSB: Reflective thinking

Objective 13.5

1) Engineered costs:
A) arise from periodic (usually annual) decisions
B) often incur a delay between when the resource is acquired and when it is used
C) include R&D and human resource costs
D) include a high level of certainty
Answer: D
Diff: 2
Terms: engineered costs
Objective: 5
AACSB: Reflective thinking

2) Discretionary costs:
A) result from a cause-and-effect relationship between the output and the input
B) include advertising and executive training costs
C) can be variable or fixed in the short run
D) pertain to processes that are detailed
Answer: B
Diff: 2
Terms: discretionary costs
Objective: 5
AACSB: Reflective thinking

3) A high level of uncertainty is represented in:
A) engineered costs
B) discretionary costs
C) both engineered and discretionary costs
D) neither engineered nor discretionary costs
Answer: B
Diff: 1
Terms: discretionary costs
Objective: 5
AACSB: Reflective thinking
4) A high level of precision between resources used and output produced exists with:
A) engineered costs
B) discretionary costs
C) both engineered and discretionary costs
D) neither engineered nor discretionary costs
Answer: A
Diff: 1
Terms: engineered costs
Objective: 5
AACSB: Reflective thinking

5) Discretionary costs:
A) have detailed processes
B) are physically observable activities
C) possess a high level of certainty
D) are usually large total amounts
Answer: D
Diff: 2
Terms: discretionary costs
Objective: 5
AACSB: Reflective thinking

6) Engineered costs:
A) possess a high level uncertainty
B) are nonrepetitive
C) are from physically observable activities
D) have processes that are sketchy or unavailable
Answer: C
Diff: 2
Terms: engineered costs
Objective: 5
AACSB: Reflective thinking

7) Conversion costs are an example of ________.
A) direct engineered costs
B) indirect engineered costs
C) discretionary costs
D) unused capacity costs
Answer: B
Diff: 2
Terms: engineered costs
Objective: 5
AACSB: Reflective thinking
8) Managers can reduce capacity-based fixed costs by measuring and managing ________.
A) unused capacity
B) variable costs
C) engineered costs
D) discretionary costs
Answer: A
Diff: 2
Terms: unused capacity, discretionary costs
Objective: 5
AACSB: Reflective thinking

9) Unused capacity is the amount of productive capacity available over and above the productive capacity employed to meet customer demand in the current period.
Answer: TRUE
Diff: 2
Terms: unused capacity, discretionary costs
Objective: 5
AACSB: Reflective thinking

10) Engineered costs have no measurable cause-and-effect relationship between output and resources used.
Answer: FALSE
Explanation: Discretionary costs have no measurable cause-and-effect relationship between output and resources used.
Diff: 2
Terms: engineered costs
Objective: 5
AACSB: Reflective thinking

11) Discretionary costs arise from periodic (usually yearly) decisions regarding the maximum amount to be incurred.
Answer: TRUE
Diff: 1
Terms: discretionary costs
Objective: 5
AACSB: Reflective thinking

12) Engineered costs contain a higher level of uncertainty than discretionary costs.
Answer: FALSE
Explanation: Discretionary costs contain a higher level of uncertainty than engineered costs.
Diff: 2
Terms: engineered costs, discretionary costs
Objective: 5
AACSB: Reflective thinking
13) Engineered costs result from a cause-and-effect relationship between the cost driver output and the resources used to produce that output.
Answer: TRUE
Diff: 2
Terms: engineered costs
Objective: 5
AACSB: Reflective thinking

14) Employee training and development cost is an example of an discretionary cost.
Answer: TRUE
Diff: 2
Terms: discretionary costs
Objective: 5
AACSB: Reflective thinking

15) It is relatively easy to identify unused capacity for discretionary costs.
Answer: FALSE
Explanation: It is difficult to identify unused capacity for discretionary costs because of the lack of a cause-and-effect relationship.
Diff: 2
Terms: unused capacity, discretionary costs
Objective: 5
AACSB: Reflective thinking

16) Downsizing is an integrated approach of configuring processes, products, and people to match costs to the activities that need to be performed to operate effectively and efficiently in the present and future.
Answer: TRUE
Diff: 1
Terms: downsizing
Objective: 5
AACSB: Reflective thinking

17) Downsizing discretionary costs is easier than downsizing engineered costs.
Answer: FALSE
Explanation: Downsizing discretionary costs is more difficult because the unused capacity of discretionary costs is generally unknown.
Diff: 2
Terms: downsizing, discretionary costs, engineered costs
Objective: 5
AACSB: Reflective thinking

18) Downsizing often means eliminating jobs, which can have an adverse effect on employee morale.
Answer: TRUE
Diff: 2
Terms: downsizing
Objective: 5
AACSB: Reflective thinking
19) Define engineered and discretionary costs and give two examples of each. 
Answer: An engineered cost results from a cause-and-effect relationship between the cost driver output and the resources used to produce that output. An example of an engineered cost would be direct materials in the production of products. Other examples of engineered costs might include shipping costs or electrical costs. A discretionary cost has two features. The first feature is that the cost arises from a periodic decision regarding the amount of cost to be incurred. The second feature is that no measurable cause-and-effect relationship exists between the output and the resources used. An example of a discretionary cost would be the cost of advertising for a product, the amount spent on researching new products, or employee training expenses.
Diff: 2
Terms: engineered costs, discretionary costs
Objective: 5
AACSB: Reflective thinking

Objective 13.6

1) Unused capacity is difficult to determine for:
A) engineered costs
B) discretionary costs
C) both engineered and discretionary costs
D) neither engineered nor discretionary costs
Answer: B
Diff: 2
Terms: discretionary costs
Objective: 6
AACSB: Reflective thinking

2) To effectively deal with unused capacity a company:
A) may downsize
B) may retain some unused capacity for future growth
C) should consider it a waste of resources and eliminate all unused capacity
D) Both A and B are correct.
Answer: D
Diff: 2
Terms: downsizing, unused capacity
Objective: 6
AACSB: Reflective thinking

3) Downsizing:
A) may include eliminating jobs
B) should be done within the context of a company's overall strategy
C) is most difficult with discretionary costs
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: downsizing
Objective: 6
AACSB: Reflective thinking
4) Rightsizing is another term for:
A) growth management
B) downsizing
C) price recovery analysis
D) cost recovery analysis
Answer: B
Diff: 2
Terms: downsizing
Objective: 6
AACSB: Reflective thinking

5) What actions can management take when unused capacity is identified?
A) eliminate the unused capacity
B) attempt to grow to utilize the unused capacity
C) Both A and B are correct.
D) Neither A nor B are correct.
Answer: C
Diff: 2
Terms: downsizing, unused capacity
Objective: 6
AACSB: Reflective thinking

6) Can a company identify unused capacity and, if so, how can unused capacity be managed?
Answer: It is relatively easy for a company to recognize unused capacity for engineered costs, but it is more difficult for a company to recognize unused capacity for discretionary costs. Downsizing, or rightsizing, is an approach to managing unused capacity by matching costs to the activities that need to be performed.
Diff: 2
Terms: engineered costs, discretionary costs, downsizing, rightsizing
Objective: 6
AACSB: Reflective thinking

Objective 13.A

1) The lower the inputs for a given set of outputs or the higher the outputs for a given set of inputs, the higher the level of:
A) standard costs
B) sales
C) productivity
D) labor costs
Answer: C
Diff: 1
Terms: productivity
Objective: A
AACSB: Reflective thinking
2) Yield variances:
A) reveal the effect of substitution within a single factor of production
B) address the productivity of a single component of one factor of production
C) capture both substitutions between factors of production as well as within factors of production
D) reveal the effect of substitution within multiple factors of production
Answer: B
Diff: 3
Terms: productivity component
Objective: A
AACSB: Reflective thinking

3) Partial productivity multiplied by the quantity of input used results in:
A) expected production
B) budgeted output
C) actual output
D) a ratio
Answer: C
Diff: 3
Terms: partial productivity
Objective: A
AACSB: Reflective thinking

4) __________ measures the relationship between actual inputs used and actual outputs achieved.
A) Total factor productivity
B) Partial productivity
C) Productivity
D) Product yield variance
Answer: C
Diff: 1
Terms: productivity
Objective: A
AACSB: Reflective thinking

5) __________ compares the quantity of output produced with the quantity of a single input used.
A) Total factor productivity
B) Partial productivity
C) Productivity
D) Product yield variance
Answer: B
Diff: 1
Terms: partial productivity
Objective: A
AACSB: Reflective thinking
6) Ali Company provided the following information:
   - Budgeted input: 39,000 gallons
   - Actual input: 35,800 gallons
   - Budgeted production: 40,000 units
   - Actual production: 38,000 units

   What is the partial productivity ratio?
   A) 0.97 units per gallon
   B) 1.02 units per gallon
   C) 1.06 units per gallon
   D) 1.12 units per gallon

   Answer: C
   Explanation: C) PP = 38,000 / 35,800 = 1.06 units per gallon
   Diff: 2
   Terms: partial productivity
   Objective: A
   AACSB: Analytical skills

7) Michael Company provided the following information:
   - Budgeted input: 19,500 gallons
   - Actual input: 17,900 gallons
   - Budgeted production: 10,000 units
   - Actual production: 19,000 units

   What is the partial productivity ratio?
   A) 0.97 units per gallon
   B) 1.02 units per gallon
   C) 1.06 units per gallon
   D) 1.12 units per gallon

   Answer: C
   Explanation: C) PP = 19,000 / 17,900 = 1.06 units per gallon
   Diff: 2
   Terms: partial productivity
   Objective: A
   AACSB: Analytical skills
8) Kirk Company provided the following information:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted input</td>
<td>24,000 gallons</td>
</tr>
<tr>
<td>Actual input</td>
<td>30,000 gallons</td>
</tr>
<tr>
<td>Budgeted production</td>
<td>10,000 units</td>
</tr>
<tr>
<td>Actual production</td>
<td>9,500 units</td>
</tr>
</tbody>
</table>

What is the partial productivity ratio?

A) 0.32 units per pound  
B) 0.33 units per pound  
C) 0.40 units per pound  
D) 3.16 units per pound

Answer: A
Explanation: A) PP = 9,500 / 30,000 = 0.32 units per pound
Diff: 2
Terms: partial productivity  
Objective: A  
AACSB: Analytical skills

9) Which of the following statements is true?

A) The lower the partial productivity ratio, the greater the productivity.  
B) Productivity has increased when the partial productivity is high.  
C) Prices of inputs are incorporated in the partial productivity ratio.  
D) The partial productivity ratio measures the number of outputs produced per multiple input.

Answer: B
Diff: 2
Terms: partial productivity, productivity  
Objective: A  
AACSB: Reflective thinking

10) What is the direct manufacturing labor partial productivity for Dangerfield Company, assuming 40,000 big and tall sport jackets were produced during 2011 and 160,000 direct manufacturing labor-hours were used?

A) 0.25 unit per direct manufacturing labor-hour  
B) 0.50 unit per direct manufacturing labor-hour  
C) 0.75 unit per direct manufacturing labor-hour  
D) 1.00 unit per direct manufacturing labor-hour

Answer: A
Explanation: A) 40,000 / 160,000 = 0.25
Diff: 2
Terms: partial productivity  
Objective: A  
AACSB: Analytical skills
11) What is the direct manufacturing labor partial productivity, assuming 20,000 units were produced during 2011 and 80,000 direct manufacturing labor-hours were used?
A) 0.25 unit per direct manufacturing labor-hour
B) 0.50 unit per direct manufacturing labor-hour
C) 0.75 unit per direct manufacturing labor-hour
D) 1.00 unit per direct manufacturing labor-hour
Answer:  A
Explanation:  A) 20,000 / 80,000 = 0.25
Diff: 2
Terms:  partial productivity
Objective:  A
AACSB:  Analytical skills

12) What terms describe the relationship between different quantities of inputs consumed and the quantities of output produced?
A) budgeted costs or actual costs
B) production technology or production function
C) static budget or flexible budget
D) production technology or production setup
Answer:  B
Diff: 2
Terms:  productivity
Objective:  A
AACSB:  Reflective thinking

13) Total factor productivity will increase if:
A) technical productivity occurs
B) the company uses more total inputs per output
C) the company incurs fewer costs per input
D) current technology becomes obsolete
Answer:  A
Diff: 3
Terms:  total factor productivity (TFP)
Objective:  A
AACSB:  Reflective thinking

14) One problem with total factor productivity revolves around which of the following?
A) the measurement of combined productivity of all inputs
B) the control operations personnel have over inputs
C) the control operations personnel have over outputs
D) the marketing mix determined by management
Answer:  A
Diff: 2
Terms:  total factor productivity (TFP)
Objective:  A
AACSB:  Reflective thinking
15) ________ is the ratio of the quantity of output produced to the costs of all inputs used, where the inputs are combined on the basis of current period prices.
   A) Total factor productivity
   B) Partial productivity
   C) Productivity
   D) Product yield variance
   Answer:  A
   Diff: 1
   Terms:  total factor productivity (TFP)
   Objective:  A
   AACSB:  Reflective thinking

16) The partial productivity of overhead resources can be measured by considering the cost driver as:
   A) budgeted input
   B) the denominator
   C) the fixed input
   D) the numerator
   Answer:  D
   Diff: 3
   Terms:  partial productivity
   Objective:  A
   AACSB:  Reflective thinking

17) Which of the following statements about productivity measures is FALSE?
   A) It may be stated in terms of dollars.
   B) It provides a convenient and easily interpreted means of aggregating across different physical outputs.
   C) The productivity measure may not be made for companies with multiple products.
   D) The key is the identification of cost drivers.
   Answer:  C
   Diff: 2
   Terms:  productivity
   Objective:  A
   AACSB:  Reflective thinking

18) The average number of student credit hours taught per faculty member is an example of a(n):
   A) expected performance measure
   B) budgeted productivity measure
   C) standard productivity measure
   D) partial productivity measure
   Answer:  D
   Diff: 3
   Terms:  partial productivity
   Objective:  A
   AACSB:  Reflective thinking
19) Productivity measures the relationship between actual inputs used (both quantities and costs) and standard outputs produced.
Answer: FALSE
Explanation: Productivity measures the relationship between actual inputs used (both quantities and costs) and actual outputs produced.
Diff: 1
Terms: productivity
Objective: A
AACSB: Reflective thinking

20) Partial productivity equals quantity of input used divided by quantity of individual output produced.
Answer: FALSE
Explanation: Partial productivity equals quantity of output produced divided by quantity of individual input used.
Diff: 1
Terms: partial productivity
Objective: A
AACSB: Reflective thinking

21) Total factor productivity (TFP) is the ratio of the quantity of output produced to the costs of all inputs used, where the inputs are combined on the basis of current period prices.
Answer: TRUE
Diff: 1
Terms: total factor productivity (TFP)
Objective: A
AACSB: Reflective thinking

22) Although total factor productivity (TFP) measures are comprehensive, operations personnel find financial TFP measures more difficult to understand and less useful than physical partial productivity measures in performing their tasks.
Answer: TRUE
Diff: 1
Terms: total factor productivity (TFP)
Objective: A
AACSB: Reflective thinking
23) Power Company has been unhappy with the financial accounting variances that its cost accounting system has been producing, because its managers believe that there is more to evaluating an operation than just examining accounting numbers. Therefore, it has started gathering data to assist in the examination of nonfinancial results of operations. The following information relates to the manufacture of remote control units for televisions, radios, and stereo components:

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote control units produced and sold</td>
<td>80,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Direct manufacture labor-hours</td>
<td>12,000</td>
<td>13,200</td>
</tr>
<tr>
<td>Direct materials used (sets)</td>
<td>80,600</td>
<td>100,500</td>
</tr>
<tr>
<td>Direct manufacture cost per hour</td>
<td>$18</td>
<td>$20</td>
</tr>
<tr>
<td>Direct materials cost per set</td>
<td>$31</td>
<td>$32</td>
</tr>
</tbody>
</table>

**Required:**

a. What is the partial productivity of direct materials for each year?

b. What is the partial productivity of direct manufacturing labor for each year?

c. Did each area improve between 2011 and 2012? Explain.

d. What will be the projected direct material and labor needs for 2013 if remote control units increase by 12,000 units, assuming Power Company applies the constant returns to scale technology?

**Answer:**

a. 
   - 2011 Partial productivity of direct materials = 80,000/80,600 = 0.993
   - 2012 Partial productivity of direct materials = 100,000/100,500 = 0.995

b. 
   - 2011 Partial productivity direct manufacturing labor = 80,000/12,000 = 6.67
   - 2012 Partial productivity direct manufacturing labor = 100,000/13,200 = 7.58

c. Yes, both areas showed improvement because the ratios went up.

d. 
   - Production increase = 12,000/100,000 = 12 percent
   - Projected direct material sets = 100,500 × 1.12 = 112,560 sets
   - Projected direct manufacturing labor = 13,200 × 1.12 = 14,784 hours

**Terms:** partial productivity

**Objective:** A

**AACSB:** Analytical skills
24) Grader Company manufactures road graders. Because its managers all have engineering backgrounds, they prefer nonfinancial information for their decision-making models. Therefore, they require the accountants gather data to assist in the examination of nonfinancial results of operations. The following information relates to the manufacture of a paver:

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units produced and sold</td>
<td>6,800</td>
<td>5,600</td>
</tr>
<tr>
<td>Direct manufacture labor-hours</td>
<td>136,000</td>
<td>115,200</td>
</tr>
<tr>
<td>Direct materials used (tons)</td>
<td>29,000</td>
<td>24,400</td>
</tr>
<tr>
<td>Direct manufacture cost per hour</td>
<td>$21</td>
<td>$22</td>
</tr>
<tr>
<td>Direct materials cost per ton</td>
<td>$431</td>
<td>$443</td>
</tr>
</tbody>
</table>

**Required:**

a. What is the partial productivity for direct materials for each year?

b. What is the partial productivity for direct manufacturing labor for each year?

c. What is the total factor productivity for each year?

**Answer:**

a. 2011 Partial productivity of direct materials = 6,800/29,000 = 0.234
   2012 Partial productivity of direct materials = 5,600/24,400 = 0.230

b. 2011 Partial productivity for direct manufacturing labor = 6,800/136,000 = 0.050
   2012 Partial productivity for direct manufacturing labor = 5,600/115,200 = 0.049

c. 2011 Direct materials = 29,000 × $431 = $12,499,000
   Direct manufacturing labor = 136,000 × $21 = 2,856,000
   Total = $15,355,000

   2012 Direct materials = 24,400 × $443 = $10,809,200
   Direct mfg. labor = 115,200 × $22 = 2,534,400
   Total = $13,343,600

   2011 Total factor productivity = 6,800/$15,355,000 = 0.00044

   2012 Total factor productivity = 5,600/$13,343,600 = 0.00042

**Diff:** 3

**Terms:** partial productivity, total factor productivity (TFP)

**Objective:** A

**AACSB:** Analytical skills
25) Fairytale Weddings manufactures wedding dresses. The following information relates to the manufacture of gowns in its Perth plant:

<table>
<thead>
<tr>
<th></th>
<th>20X1</th>
<th>20X2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units produced and sold</td>
<td>43,000</td>
<td>52,600</td>
</tr>
<tr>
<td>Direct manufacture labor-hours</td>
<td>22,000</td>
<td>26,000</td>
</tr>
<tr>
<td>Direct materials used (square yards)</td>
<td>130,000</td>
<td>152,000</td>
</tr>
<tr>
<td>Direct manufacture cost per hour</td>
<td>$16</td>
<td>$17</td>
</tr>
<tr>
<td>Direct materials cost per yard</td>
<td>$10</td>
<td>$11</td>
</tr>
</tbody>
</table>

**Required:**
Prepare an analysis of change in annual costs from 20X1 to 20X2 including direct materials, direct manufacturing labor, and total inputs.

**Answer:**

**Direct materials:**

Actual 20X1 costs: \(130,000 \times 10 = \$1,300,000\)

20X1 input for 20X2 output: \(130,000 \times \frac{52,600}{43,000} \times 10 = \$1,590,233\)

*Output adjustment* \(\$290,233\) U

20X1 input for 20X2 output: \(= \$1,590,233\)

20X1 input with 20X2 costs: \(130,000 \times \frac{52,600}{43,000} \times 11 = \$1,749,256\)

*Input price change* \(\$159,023\) U

20X1 input with 20X2 costs: \(= \$1,749,256\)

20X2 costs: \(152,000 \times 11 = 1,672,000\)

*Productivity change* \(\$77,256\) F

**Direct manufacturing labor:**

Actual 20X1 costs: \(22,000 \times 16 = \$352,000\)

20X1 input for 20X2 output: \(22,000 \times \frac{52,600}{43,000} \times 16 = \$430,586\)

*Output adjustment* \(\$78,586\) U

20X1 input for 20X2 output: \(= \$430,586\)

20X1 input with 20X2 costs: \(22,000 \times \frac{52,600}{43,000} \times 17 = \$457,498\)

*Input price change* \(\$26,912\) U

20X1 input with 20X2 costs: \(= \$457,498\)

20X2 costs: \(26,000 \times 17 = 442,000\)

*Productivity change* \(\$15,498\) F

**All inputs:**

Output adjustment: \$290,233 U + $78,586 U = \$368,819 U

Input price change: \$159,023 U + $26,912 U = \$185,935 U

Productivity change: \$77,256 F + $15,498 F = \$ 92,754 F

Diff: 3

Terms: productivity, partial productivity

Objective: A

AACSB: Analytical skills
26) Ralph Company has been very aggressive in developing various types of financial and nonfinancial measurement schemes to help with the evaluation of its manufacturing processes. It appears that some of the managers are suboptimizing in that their decision processes are geared solely for their department's benefit, sometimes to the detriment of the organization as a whole.

**Required:**
What changes in the evaluation system could the company implement to help minimize the suboptimization of the managers' decision-making process?

**Answer:** The company could implement a total factor productivity concept. Its major advantage is that it measures the combined productivity of all inputs to produce outputs and, therefore, explicitly evaluates substitution among inputs. For example, if buying a cheap material makes the cost of materials look favorable but causes more labor-hours, therefore causing labor costs to be unfavorable, suboptimization may be occurring. The total factor productivity takes into account both the materials costs and the labor costs and if they offset each other, that is fine, but if they do not offset, then the variance will be so noted.

**Diff:** 2

**Terms:** total factor productivity (TFP)

**Objective:** A

**AACSB:** Reflective thinking

27) Total factor productivity (TFP) is easy to compute for a single-product company. When dealing with a multiproduct company, one of two adjustments must be made. What are these potential adjustments?

**Answer:** One of the following two adjustments must be made in the TFP calculations:

1. Convert the outputs from physical measures to a dollar value common denominator, analogous to the multiple input case.

2. Allocate the input costs to the different outputs. This is appropriate when the inputs can be reasonably allocated to the different outputs.

**Diff:** 2

**Terms:** total factor productivity (TFP)

**Objective:** A

**AACSB:** Reflective thinking
1) Costs which are NOT economically feasible to trace but which are related to a cost object are known as:
   A) fixed costs
   B) direct costs
   C) indirect costs
   D) variable costs
   Answer: C
   Diff: 1
   Terms: cost allocation
   Objective: 1
   AACSB: Reflective thinking

2) Any item for which a separate measurement of cost is desired is known as:
   A) cost allocation
   B) a cost object
   C) a direct cost
   D) an indirect cost
   Answer: B
   Diff: 1
   Terms: cost object
   Objective: 1
   AACSB: Reflective thinking

3) Indirect costs:
   A) often comprise a large percentage of overall costs assigned to a cost object
   B) specifically exclude marketing costs
   C) cannot be used for external reporting
   D) are treated as period costs and not as product costs
   Answer: A
   Diff: 3
   Terms: indirect costs
   Objective: 1
   AACSB: Reflective thinking

4) All of the following illustrate purposes for allocating costs to cost objects EXCEPT to:
   A) provide information for economic decisions
   B) motivate managers and employees
   C) determine a selling price the market will bear
   D) measure income and assets for reporting to external parties
   Answer: C
   Diff: 2
   Terms: cost allocation
   Objective: 1
   AACSB: Reflective thinking
5) Which of the following illustrates a purpose for allocating costs to cost objects?
A) to motivate managers and employees
B) to provide information to customers
C) to determine a selling price the market will bear
D) to measure liabilities
Answer: A
Diff: 2
Terms: cost allocation
Objective: 1
AACSB: Reflective thinking

6) The costs of all six value-chain functions should be included when determining:
A) whether to add a new product line
B) the selling price of a service
C) whether to make or buy a component part from another manufacturer
D) All of these answers are correct.
Answer: D
Diff: 3
Terms: cost allocation
Objective: 1
AACSB: Reflective thinking

7) R&D costs are used for which purpose of cost allocation?
A) to provide information for economic decisions
B) to report to external parties when using generally accepted accounting principles
C) to calculate costs of a government contract
D) All of these answers are correct.
Answer: A
Diff: 3
Terms: cost allocation
Objective: 1
AACSB: Communication

8) Which purpose of cost allocation is used to encourage sales representatives to push high-margin products or services?
A) to provide information for economic decisions
B) to motivate managers and other employees
C) to justify costs or compute reimbursement
D) to measure income and assets for reporting to external parties
Answer: B
Diff: 2
Terms: cost allocation
Objective: 1
AACSB: Reflective thinking
9) Which purpose of cost allocation is used to decide on the selling price for a customized product or service?
A) to provide information for economic decisions
B) to motivate managers and other employees
C) to justify costs or compute reimbursement
D) to measure income and assets for reporting to external parties
Answer: A
Diff: 2
Terms: cost allocation
Objective: 1
AACSB: Reflective thinking

10) Which purpose of cost allocation is used to cost products at a "fair" price?
A) to provide information for economic decisions
B) to motivate managers and other employees
C) to justify costs or compute reimbursement
D) to measure income and assets for reporting to external parties
Answer: C
Diff: 2
Terms: cost allocation
Objective: 1
AACSB: Reflective thinking

11) Which purpose of cost allocation is used to cost inventories for reporting to tax authorities?
A) to provide information for economic decisions
B) to motivate managers and other employees
C) to justify costs or compute reimbursement
D) to measure income and assets for reporting to external parties
Answer: D
Diff: 2
Terms: cost allocation
Objective: 1
AACSB: Reflective thinking

12) Indirect costs are costs that CANNOT be traced to cost objects in an economically feasible way.
Answer: TRUE
Diff: 1
Terms: cost allocation
Objective: 1
AACSB: Reflective thinking

13) To motivate engineers to design simpler products, costs for production, distribution, and customer service may be included in product-cost estimates.
Answer: TRUE
Diff: 2
Terms: cost allocation
Objective: 1
AACSB: Reflective thinking
14) One of the purposes of allocating direct costs is to justify costs or compute reimbursement amounts.
Answer: TRUE
Explanation: One of the purposes of allocating indirect costs is to justify costs or compute reimbursement amounts.
Diff: 2
Terms: cost allocation
Objective: 1
AACSB: Reflective thinking

15) For external reporting, inventoriable costs under GAAP sometimes include R&D costs.
Answer: FALSE
Explanation: Under GAAP, inventoriable costs include only the costs of producing and sometimes the design costs of the product.
Diff: 2
Terms: cost allocation
Objective: 1
AACSB: Reflective thinking

16) To allocate a cost, it is only necessary to satisfy one of the purposes for which costs are allocated.
Answer: TRUE
Explanation: To allocate a cost, it is only necessary to satisfy one of the purposes for which costs are allocated.
Diff: 2
Terms: cost allocation
Objective: 1
AACSB: Reflective thinking
17) For each item listed select the appropriate purpose of cost allocation from the list below. A purpose may be used more than once.

1. To cost a product at a fair price for government contracts
2. To encourage simpler product design
3. To decide on an appropriate selling price for a special-order product
4. To cost inventories for reporting on a company's tax return
5. To encourage the sales department to focus on high-margin products
6. To evaluate a make or buy decision
7. To cost inventories for the balance sheet
8. To decide whether to add or delete a product line

_Purposes of cost allocation:_
- To provide information for economic decisions
- To motivate managers and other employees
- To justify costs or compute reimbursement amounts
- To measure income and assets

Answer:
1. c
2. b
3. a
4. d
5. b
6. a
7. d
8. a

Diff: 2
Terms: cost allocation
Objective: 1
AACSB: Analytical skills

18) A company might choose to allocate corporate costs to various divisions within the company for what four purposes? Give an example of each.

Answer:
1. To provide information for economic decisions, for example, allocating costs from all six value-chain functions to decide on the selling price of a customized product.
2. To motivate managers and employees, for example, allocating corporate costs such as accounting support to division managers to discourage requesting a multitude of unnecessary financial reports.
3. To justify costs or compute reimbursement, for example, to allocate fixed design and production costs when arriving at a fair price for a government contract.
4. To measure income and assets for reporting to external parties, for example, allocating manufacturing overhead when costing inventories for financial statements presented in the company's annual report.

Note: Examples will vary.

Diff: 2
Terms: cost allocation
Objective: 1
AACSB: Reflective thinking
19) An electronics manufacturer is trying to encourage its engineers to design simpler products so that overall costs are reduced.

**Required:**
Which of the value-chain function costs (R&D, design, production, marketing, distribution, customer service) should be included in product-cost estimates to achieve the above purpose? Why?

**Answer:** All costs that are affected by the design should be included in the product cost estimate. These costs include the cost of design, production, distribution, and customer service.

**Diff:** 1
**Terms:** cost allocation

**Objective:** 1

**AACSB:** Reflective thinking

20) Briefly describe the four criteria used to guide cost-allocation decisions.

**Answer:**
1. **Cause and effect** - managers identify the variables that cause resources to be consumed.
2. **Benefits received** - managers identify the beneficiaries of the outputs of the cost object.
3. **Fairness or equity** - establishing a selling price that is deemed fair by contracting parties.
4. **Ability to bear** - advocates allocating costs in proportion to the cost object's ability to bear costs allocated to it.

**Diff:** 1
**Terms:** cost allocation

**Objective:** 1

**AACSB:** Reflective thinking

**Objective 14.2**

1) When the purpose of cost allocation is to provide information for economic decisions or to motivate managers and employees, the best criteria are:

A) the cause-and-effect and the ability-to-bear criteria  
B) the cause-and-effect and the benefits-received criteria  
C) the benefits-received and the fairness criteria  
D) the fairness and the ability-to-bear criteria

**Answer:** B

**Diff:** 2
**Terms:** cost allocation

**Objective:** 2

**AACSB:** Reflective thinking

2) To guide cost allocation decisions, the cause-and-effect criterion:

A) is used less frequently than the other criteria  
B) is the primary criterion used in activity-based costing  
C) is a difficult criterion on which to obtain agreement  
D) may allocate corporate salaries to divisions based on profits

**Answer:** B

**Diff:** 3
**Terms:** cost allocation

**Objective:** 2

**AACSB:** Reflective thinking
3) To guide cost allocation decisions, the benefits-received criterion:
A) generally uses the cost driver as the cost allocation base
B) results in subsidizing products that are not profitable
C) is the primarily used criterion in activity-based costing
D) may use an allocation base of division revenues to allocate advertising costs
Answer: D
Diff: 3
Terms: cost allocation
Objective: 2
AACSB: Reflective thinking

4) To guide cost allocation decisions, the fairness or equity criterion is:
A) the criterion often cited in government contracts
B) superior when the purpose of cost allocation is for economic decisions
C) used more frequently than the other criteria
D) the primary criterion used in activity-based costing
Answer: A
Diff: 3
Terms: cost allocation
Objective: 2
AACSB: Ethical reasoning

5) To guide cost allocation decisions, the ability to bear criterion:
A) is likely to be the most credible to operating personnel
B) allocates costs in proportion to the benefits received
C) results in subsidizing products that are not profitable
D) is the criterion often cited in government contracts
Answer: C
Diff: 3
Terms: cost allocation
Objective: 2
AACSB: Reflective thinking

6) Which cost-allocation criterion is appropriate when making an economic decision?
A) the fairness or equity criterion
B) the ability to bear criterion
C) the cause-and-effect criterion
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: cost allocation
Objective: 2
AACSB: Reflective thinking
7) Which cost-allocation criterion is most likely to subsidize poor performers at the expense of the best performers?
A) the fairness or equity criterion
B) the benefits-received criterion
C) the ability to bear criterion
D) the cause-and-effect criterion
Answer: C
Diff: 2
Terms: cost allocation
Objective: 2
AACSB: Reflective thinking

8) A challenge to using cost-benefit criteria for allocating costs is that:
A) the costs of designing and implementing complex cost allocations are not readily apparent
B) the benefits of making better-informed pricing decisions are difficult to measure
C) cost systems are being simplified and fewer multiple cost-allocation bases are being used
D) the costs of collecting and processing information keep spiraling upward
Answer: B
Diff: 3
Terms: cost allocation
Objective: 2
AACSB: Reflective thinking

9) Today, companies are simplifying their cost systems and moving toward less-detailed and less-complex cost allocation bases.
Answer: FALSE
Explanation: Companies are moving toward more-detailed and more-complex cost allocations because today technology can capture these costs in a relatively inexpensive manner.
Diff: 3
Terms: cost allocation
Objective: 2
AACSB: Reflective thinking

10) Using the fairness criterion, the costs are allocated among the beneficiaries in proportion to the benefits each receives.
Answer: FALSE
Explanation: Using the benefits received criterion, the costs are allocated among the beneficiaries in proportion to the benefits each receives.
Diff: 3
Terms: cost allocation
Objective: 2
AACSB: Reflective thinking
11) Under the fairness criterion, cost allocation is NOT viewed as a reasonable means of establishing a selling price.
Answer: FALSE
Explanation: Cost allocation is viewed as a fair way to set a selling price between two contracting parties.
Diff: 3
Terms: cost allocation
Objective: 2
AACSB: Ethical reasoning

12) When using the cause-and-effect criterion, cost drivers are selected as the cost allocation bases.
Answer: TRUE
Diff: 1
Terms: cost allocation
Objective: 2
AACSB: Reflective thinking

13) The ability-to-bear criterion is considered superior when the purpose of cost allocation is motivation.
Answer: FALSE
Explanation: The cause-and-effect or benefits-received criteria is considered superior when the purpose of cost allocation is motivation.
Diff: 2
Terms: cost allocation
Objective: 2
AACSB: Reflective thinking

14) The benefits of implementing a more-complex cost allocation system are relatively easy to quantify for application of the cost-benefit approach.
Answer: FALSE
Explanation: The benefits of implementing a more-complex cost allocation system are difficult to measure.
Diff: 2
Terms: cost allocation
Objective: 2
AACSB: Reflective thinking

Objective 14.3

1) Corporate overhead costs can be allocated:
A) using a single cost pool
B) to divisions using one cost pool and then reallocating costs to products using multiple cost pools
C) using numerous individual corporate cost pools
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: cost allocation
Objective: 3
AACSB: Reflective thinking
2) The most likely reason for allocating all corporate costs to divisions include that:
   A) division managers make decisions that ultimately control corporate costs
   B) divisions receive benefits from all corporate costs
   C) the hierarchy of costs promotes cost management
   D) it is best to use multiple cost objects
   Answer:  B
   Diff: 3
   Terms:  cost allocation
   Objective:  3
   AACSB:  Reflective thinking

3) The most likely reason for NOT allocating corporate costs to divisions include that:
   A) these costs are not controllable by division managers
   B) these costs are incurred to support division activities, not corporate activities
   C) division resources are already used to attain corporate goals
   D) divisions receive no benefits from corporate costs
   Answer:  A
   Diff: 3
   Terms:  cost allocation
   Objective:  3
   AACSB:  Reflective thinking

4) Some companies only allocate corporate costs to divisions that are:
   A) planned and under the control of division managers
   B) output unit-level costs
   C) perceived as causally related to division activities
   D) direct costs
   Answer:  C
   Diff: 2
   Terms:  cost allocation
   Objective:  3
   AACSB:  Reflective thinking

5) Which is the preferred allocation method for performance evaluation?
   A) allocating all corporate costs
   B) allocating only human resource cost
   C) allocating controllable costs
   D) allocating uncontrollable costs
   Answer:  C
   Diff: 2
   Terms:  cost allocation
   Objective:  3
   AACSB:  Reflective thinking
6) NOT allocating some corporate costs to divisions and products results in:
A) an increase in overall corporate profitability
B) the sum of individual product profitability being less than overall company profitability
C) the sum of individual product profitability being greater than overall company profitability
D) a decrease in overall corporate profitability
Answer:  C
Diff:  3
Terms:  cost allocation
Objective:  3
AACSB:  Reflective thinking

7) The greater the degree of homogeneity, the:
A) greater the number of needed cost pools
B) fewer the number of needed cost pools
C) less accurate the costs of a particular cost object
D) greater the variety of cause-and-effect relationships with the cost driver
Answer:  B
Diff:  2
Terms:  homogeneous cost pool
Objective:  3
AACSB:  Reflective thinking

8) When individual activities within a cost pool have a similar relationship with the cost driver, those costs:
A) need to be reallocated
B) need multiple cost drivers
C) are considered a homogeneous cost pool
D) are considered an allocated cost pool
Answer:  C
Diff:  2
Terms:  homogeneous cost pool
Objective:  3
AACSB:  Reflective thinking

9) Homogeneous cost pools lead to:
A) more accurate costs of a given cost object
B) more resources being assigned to that cost object
C) the need for more cost drivers
D) Both A and C are correct.
Answer:  A
Diff:  2
Terms:  homogeneous cost pool
Objective:  3
AACSB:  Reflective thinking
10) Identifying homogeneous cost pools:
A) requires judgment and should be reevaluated on a regular basis
B) should include the input of management
C) should include a cost-benefit analysis
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: homogeneous cost pool
Objective: 3
AACSB: Reflective thinking

11) To allocate corporate costs to divisions, the allocation base used should:
A) be an output unit-level base
B) have the best cause-and-effect relationship with the costs
C) combine administrative costs and human resource management costs
D) allocate the full costs
Answer: B
Diff: 3
Terms: cost allocation
Objective: 3
AACSB: Reflective thinking

12) Corporate administrative costs allocated to a division cost pool are most likely to be:
A) output unit-level costs
B) facility-sustaining costs
C) product-sustaining costs
D) batch-level costs
Answer: B
Diff: 1
Terms: cost allocation
Objective: 3
AACSB: Reflective thinking

13) To manage setup costs, a corporation might focus on the:
A) number of setup-hours
B) number of units included in each production run
C) batch-level costs incurred per setup-hour
D) Both A and C are correct.
Answer: D
Diff: 3
Terms: homogeneous cost pool
Objective: 3
AACSB: Reflective thinking
Answer the following questions using the information below:

The Hassan Corporation has an Electric Mixer Division and an Electric Lamp Division. Of a $10,000,000 bond issuance, the Electric Mixer Division used $7,000,000 and the Electric Lamp Division used $3,000,000 for expansion. Interest costs on the bond totaled $750,000 for the year.

14) What amount of interest costs should be allocated to the Electric Mixer Division?
A) $225,000
B) $525,000
C) $2,100,000
D) $7,000,000
Answer: B
Explanation: B) $7,000,000 / $10,000,000 × $750,000 = $525,000
Diff: 2
Terms: cost allocation
Objective: 3
AACSB: Analytical skills

15) What amount of interest costs should be allocated to the Electric Lamp Division?
A) $225,000
B) $525,000
C) $2,100,000
D) $3,000,000
Answer: A
Explanation: A) $3,000,000 / $10,000,000 × $750,000 = $225,000
Diff: 2
Terms: cost allocation
Objective: 3
AACSB: Analytical skills

16) The above interest costs would be considered a(n):
A) output unit-level cost
B) facility-sustaining cost
C) product-sustaining cost
D) batch-level cost
Answer: C
Diff: 2
Terms: homogeneous cost pool
Objective: 3
AACSB: Analytical skills
17) Which corporate costs should be allocated to divisions?
A) fixed costs only
B) variable costs only
C) neither fixed nor variable costs
D) both fixed and variable costs
Answer: D
Diff: 2
Terms: cost allocation
Objective: 3
AACSB: Reflective thinking

18) The three major corporate cost categories are treasury, human resource management, and corporate administration costs.
Answer: TRUE
Diff: 2
Terms: cost allocation
Objective: 3
AACSB: Reflective thinking

19) Allocating all corporate costs motivates division managers to examine how corporate costs are planned and controlled.
Answer: TRUE
Explanation: Allocating all corporate costs motivates division managers to examine how corporate costs are planned and controlled.
Diff: 2
Terms: cost allocation
Objective: 3
AACSB: Reflective thinking

20) Companies that want to calculate the full cost of products must allocate all corporate costs to indirect-cost pools of divisions.
Answer: TRUE
Diff: 3
Terms: cost allocation
Objective: 3
AACSB: Reflective thinking

21) When there is a lesser degree of homogeneity, fewer cost pools are required to accurately explain the use of company resources.
Answer: FALSE
Explanation: The greater the degree of homogeneity, the fewer the cost pools required to accurately explain the use of company resources.
Diff: 2
Terms: homogeneous cost pool
Objective: 3
AACSB: Reflective thinking
22) If a cost pool is homogeneous, the cost allocations using that pool will be the same as they would be if costs of each individual activity in that pool were allocated separately.
   Answer: TRUE
   Diff: 2
   Terms: homogeneous cost pool
   Objective: 3
   AACSB: Reflective thinking

23) Costs in a homogeneous cost pools have the same or a similar cause-and-effect or benefits-received relationship with the cost-allocation base.
   Answer: TRUE
   Diff: 2
   Terms: homogeneous cost pool
   Objective: 3
   AACSB: Reflective thinking

24) An individual cost item can be simultaneously a direct cost of one cost object and an indirect cost of another cost object.
   Answer: TRUE
   Diff: 3
   Terms: homogeneous cost pool
   Objective: 3
   AACSB: Reflective thinking

25) Advances in information-gathering technology make it more likely that multiple cost-pool systems will pass the cost-benefit test.
   Answer: TRUE
   Diff: 2
   Terms: homogeneous cost pool
   Objective: 3
   AACSB: Reflective thinking

26) Once a cost pool has been established, it should NOT need to be revisited or revised.
   Answer: FALSE
   Explanation: Once a cost pool has been established, it is often necessary to revisit it or revise it.
   Diff: 2
   Terms: homogeneous cost pool
   Objective: 3
   AACSB: Reflective thinking
27) For each cost pool listed select an appropriate allocation base from the list below. An allocation base may be used only once. Assume a manufacturing company.

_Allocation bases_ for which the information system can provide data:

1. Number of employees per department
2. Employee wages and salaries per department
3. Production facility square footage
4. Hours of operation of each production department
5. Machine hours by department
6. Operations costs of each department
7. Hours of computer use per month per department
8. Indirect labor-hours per department

_Cost pools:_

- a. Vice President of Finance's office expenses
- b. Computer operations used in conjunction with manufacturing
- c. Personnel Department
- d. Manufacturing machinery cost
- e. Energy costs

_Answer:_

6 a. Operations costs of each department
7 b. Hours of computer use per month per department
1 c. Number of employees per department
5 d. Machine-hours by department
4 e. Hours of operation of each production department

Diff: 2
Terms: cost allocation
Objective: 3
AACSB: Analytical skills

28) Should a company allocate its corporate costs to divisions?

_Answer:_ Some companies allocate all corporate costs to divisions because corporate costs are incurred to support division activities. Allocating all corporate costs motivates division managers to examine how corporate costs are planned and controlled. Also, companies that want to calculate the full cost of products in order to make some economic decision must allocate corporate costs to indirect-cost pools of divisions.

Some companies do not allocate corporate costs to divisions because these costs are not controllable by division managers. Particularly if performance evaluations are based on these allocations, a company will often not choose to allocate certain corporate costs that are not perceived as being controllable by division management.

Other companies allocate only those corporate costs, such as corporate human resources, that are widely perceived as either causally related to division activities or provide explicit benefits to divisions.

Diff: 2
Terms: cost allocation
Objective: 3
AACSB: Reflective thinking
Objective 14.4

1) Customers making large contributions to the profitability of the company should:
A) be treated the same as other customers because all customers are important
B) receive a higher level of attention from the company than less profitable customers
C) be charged higher prices for the same products than less profitable customers
D) not be offered the volume-based price discounts offered to less profitable customers
Answer: B
Diff: 3
Terms: customer-profitability analysis
Objective: 4
AACSB: Reflective thinking

2) Price discounts are influenced by:
A) the volume of product purchased
B) a desire to sell to a customer in an area with high-growth potential
C) negotiating skills of the sales person
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: price discounting
Objective: 4
AACSB: Reflective thinking

3) Price discounts should NEVER be viewed as:
A) price discrimination
B) predatory pricing
C) unethical
D) All of the above are correct.
Answer: D
Diff: 2
Terms: price discrimination, predatory pricing
Objective: 4
AACSB: Ethical reasoning

4) Customer revenues and ________ are the determinants of customer profitability
A) customer profile
B) customer costs
C) customer location
D) customer industry
Answer: B
Diff: 2
Terms: customer profitability analysis
Objective: 4
AACSB: Reflective thinking
5) To improve customer profitability, companies should track:
A) only the final invoice price of a sale
B) the volume of the products purchased by each customer
C) discounts taken by each customer
D) Both B and C are correct.
Answer: D
Diff: 2
Terms: customer-profitability analysis
Objective: 4
AACSB: Reflective thinking

6) To improve customer profitability, companies should:
A) strictly enforce their volume-based price discounting policy
B) track discounts by customer
C) track discounts by sales person
D) Both B and C are correct.
Answer: D
Diff: 2
Terms: customer-profitability analysis
Objective: 4
AACSB: Reflective thinking

7) All customers are equally important to a company and should receive equal levels of attention.
Answer: FALSE
Explanation: Customers should receive a level of attention from the company that matches their contribution to the company's profitability.
Diff: 3
Terms: customer-profitability analysis
Objective: 4
AACSB: Ethical reasoning

8) Customer-profitability analysis is the reporting and assessment of revenues earned from customers and the costs incurred to earn those revenues.
Answer: TRUE
Diff: 1
Terms: customer-profitability analysis
Objective: 4
AACSB: Reflective thinking

9) Price discounts must be uniform among all customers.
Answer: FALSE
Explanation: Price discounts will depend on the size of the purchase and the importance of the customer.
Diff: 3
Terms: price discounting
Objective: 4
AACSB: Ethical reasoning
10) There are two elements that influence customer profitability revenues and costs.
Answer: TRUE
Diff: 2
Terms: customer-profitability analysis
Objective: 4
AACSB: Reflective thinking

11) Companies that only record the invoice price can usually track the magnitude of price discounting.
Answer: FALSE
Explanation: To track discounting, the discount must be recorded.
Diff: 2
Terms: price discounting
Objective: 4
AACSB: Reflective thinking

12) A customer cost hierarchy categorizes costs related to customers into different cost pools on the basis of using only one cost driver.
Answer: FALSE
Explanation: A customer cost hierarchy categorizes costs related to customers into different cost pools using different drivers.
Diff: 2
Terms: homogeneous cost pool, customer cost hierarchy
Objective: 4
AACSB: Reflective thinking

13) An activity-based costing system may focus on customers rather than products.
Answer: TRUE
Diff: 2
Terms: customer-profitability analysis
Objective: 4
AACSB: Reflective thinking

14) A customer cost hierarchy may include customer-sustaining costs.
Answer: TRUE
Diff: 2
Terms: customer cost hierarchy
Objective: 4
AACSB: Reflective thinking

15) A customer cost hierarchy may include distribution-channel costs.
Answer: TRUE
Diff: 1
Terms: customer cost hierarchy
Objective: 4
AACSB: Reflective thinking
16) Corporate-sustaining costs are costs of activities to support individual customers, regardless of the number of units or batches of product delivered to the customer.
Answer: FALSE
Explanation: Customer-sustaining costs are costs of activities to support individual customers, regardless of the number of units or batches of product delivered to the customer.
Diff: 2
Terms: customer cost hierarchy
Objective: 4
AACSB: Reflective thinking

17) In general, distribution-channel costs are more easily influenced by customer actions than customer batch-level costs.
Answer: FALSE
Explanation: In general, customer batch-level costs are more easily influenced by customer actions than distribution-channel costs.
Diff: 3
Terms: customer cost hierarchy
Objective: 4
AACSB: Reflective thinking

18) If one of five distribution channels is discontinued, corporate-sustaining costs such as general administration costs will most likely be reduced by 20%.
Answer: FALSE
Explanation: If one of five distribution channels is discontinued, corporate-sustaining costs such as general administration costs will most likely not be affected.
Diff: 3
Terms: customer cost hierarchy
Objective: 4
AACSB: Reflective thinking
19) Handy-Man Services is a repair-service company specializing in small household jobs. Each client pays a fixed monthly service fee based on the number of rooms in the house. Records are kept on the time and material costs used for each repair. The following profitability data apply to five customers:

<table>
<thead>
<tr>
<th>Customer</th>
<th>Revenues</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marveline Burnett</td>
<td>$300</td>
<td>$225</td>
</tr>
<tr>
<td>J Jackson</td>
<td>200</td>
<td>305</td>
</tr>
<tr>
<td>Roger Jones</td>
<td>80</td>
<td>75</td>
</tr>
<tr>
<td>Paul Saas</td>
<td>75</td>
<td>110</td>
</tr>
<tr>
<td>Becky Stephan</td>
<td>350</td>
<td>220</td>
</tr>
</tbody>
</table>

**Required:**

a. Compute the operating income for each of the five customers.

b. What options should Handy-Man Services consider in light of the customer-profitability results?

c. What problems might Handy-Man Services encounter in accurately estimating the operating costs of each customer?

**Answer:**

<table>
<thead>
<tr>
<th>Customer</th>
<th>Revenues</th>
<th>Costs</th>
<th>Operating income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marveline Burnett</td>
<td>$300</td>
<td>$225</td>
<td>$ 75</td>
</tr>
<tr>
<td>J Jackson</td>
<td>200</td>
<td>305</td>
<td>(105)</td>
</tr>
<tr>
<td>Roger Jones</td>
<td>80</td>
<td>75</td>
<td>5</td>
</tr>
<tr>
<td>Paul Saas</td>
<td>75</td>
<td>110</td>
<td>(35)</td>
</tr>
<tr>
<td>Becky Stephan</td>
<td>350</td>
<td>220</td>
<td>130</td>
</tr>
</tbody>
</table>

**b.**

1. Pay increased attention to the profitable customers Stephan and Burnett.
2. Seek ways of reducing costs and increasing revenues for the loss accounts of J Jackson and Paul Saas. Work with the customers so their behavior reduces overall costs. Reduce costs with better scheduling. Maybe a different fee schedule needs to be implemented depending on the age of the house, the distance to the home, if the repair is preventive or an emergency, etc. Determine whether the operating income pattern will probably continue or not and why.
3. As a last resort, the company may want to discontinue the Jackson account if the customer does not agree to a fee increase and the operating loss pattern is expected to continue.

c. Problems in accurately estimating operating costs of each customer include:

1. The basic underlying records may not be accurate.
2. Some repair personnel may be efficient and more experienced, others may be less experienced and slower, and still others may "chit-chat" more with the clients than others.
3. Costs that are allocated to more than one customer may be distorting operating income. For example, how is the cost of a trip for parts for three different customers allocated?

**Diff: 2**

**Terms:** customer-profitability analysis

**Objective:** 4

**AACSB:** Analytical skills
Objective 14.5

1) ABC systems use the concept of a ________ to identify the cost drivers that best demonstrate the cause-and-effect relationship between each activity and the costs in the related cost pool.
A) cost hierarchy
B) cost pool
C) cost allocation
D) cost driver
Answer: A
Diff: 2
Terms: cost hierarchy
Objective: 5
AACSB: Reflective thinking

2) A customer cost hierarchy categorizes costs related to customers into different cost pools on the basis of different:
A) types of cost drivers
B) benefits-received relationships
C) levels of cause-and-effect relationships
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: customer cost hierarchy
Objective: 5
AACSB: Reflective thinking

3) Costs incurred to process orders would most likely be classified as a:
A) customer output unit-level cost
B) customer batch-level cost
C) customer-sustaining cost
D) corporate-sustaining cost
Answer: B
Diff: 1
Terms: customer cost hierarchy
Objective: 5
AACSB: Reflective thinking

4) Top management and general administration costs would most likely be classified as a:
A) customer output unit-level cost
B) customer batch-level cost
C) customer-sustaining cost
D) corporate-sustaining cost
Answer: D
Diff: 1
Terms: customer cost hierarchy
Objective: 5
AACSB: Reflective thinking
5) The cost of visiting customers would most likely be classified as a:
A) customer output unit-level cost
B) customer batch-level cost
C) customer-sustaining cost
D) corporate-sustaining cost
Answer:  C
Diff:  1
Terms:  customer cost hierarchy
Objective:  5
AACSB:  Reflective thinking

6) Costs incurred to handle each unit sold would most likely be classified as a:
A) customer output unit-level cost
B) customer batch-level cost
C) customer-sustaining cost
D) corporate-sustaining cost
Answer:  A
Diff:  1
Terms:  customer cost hierarchy
Objective:  5
AACSB:  Reflective thinking

7) The cost of the manager of a retail distribution channel would most likely be classified as a:
A) customer-sustaining cost
B) distribution-channel cost
C) customer batch-level cost
D) corporate-sustaining cost
Answer:  B
Diff:  1
Terms:  customer cost hierarchy
Objective:  5
AACSB:  Reflective thinking

8) Which item is NOT a category in the customer cost hierarchy?
A) customer output unit-level costs
B) distribution-channel costs
C) corporate-sustaining costs
D) None of the above are correct.
Answer:  D
Diff:  1
Terms:  customer cost hierarchy
Objective:  5
AACSB:  Reflective thinking
9) ______ categorizes costs related to customers into different cost pools on the basis of either different classes of cost drivers or different degrees of difficulty in determining the cause-and-effect (or benefits-received) relationships.
A) Customer-profitability analysis  
B) Customer revenues  
C) Customer cost hierarchy  
D) Price discounting  
Answer:  C  
Diff: 1  
Terms: customer cost hierarchy  
Objective:  5  
AACSB: Reflective thinking

10) To more accurately assess customer profitability, corporate-sustaining costs should be allocated.  
Answer: FALSE  
Explanation: The allocation of corporate-sustaining costs serves no useful purpose in assessing customer profitability, decision making, performance evaluation, or motivation.  
Diff: 3  
Terms: customer-profitability analysis, customer cost hierarchy  
Objective:  5  
AACSB: Reflective thinking

11) The higher the likely growth of the customer's industry and the customer's sales, the more valuable the customer.  
Answer: TRUE  
Diff: 2  
Terms: customer profitability analysis  
Objective:  5  
AACSB: Reflective thinking

12) It is common to find that a small number of customers generate a high percentage of operating income.  
Answer: TRUE  
Diff: 2  
Terms: customer-profitability analysis  
Objective:  5  
AACSB: Reflective thinking

13) Managers who utilize customer profitability charts should drop customers that generate a negative customer operating income, since dropping an unprofitable customer will automatically cause overall income to increase.  
Answer: FALSE  
Explanation: Managers who utilize customer profitability charts should not drop customers that generate a negative customer operating income, because dropping an unprofitable customer may not cause overall income to increase.  
Diff: 2  
Terms: customer profitability analysis  
Objective:  5  
AACSB: Reflective thinking
14) It is possible that the smallest customer in terms of revenue is the most profitable customer.
Answer: TRUE
Diff: 2
Terms: customer profitability analysis
Objective: 5
AACSB: Reflective thinking

15) List at least three different levels of costs in a customer-cost hierarchy and an example of each.
Answer: List any three of the following:
1. Customer output unit-level costs, product-handling costs of each product sold
2. Customer batch-level costs, order processing costs incurred
3. Customer-sustaining costs, costs of visits to the customer
4. Distribution-channel costs, a particular distribution channel manager's salary
5. Corporate-sustaining costs, costs of top management

Note: Examples will vary.
Diff: 2
Terms: customer cost hierarchy
Objective: 5
AACSB: Reflective thinking

Objective 14.6

1) In analyzing customer-level indirect costs, which category of the customer-cost hierarchy would you NOT consider?
A) distribution-channel costs
B) customer output-unit-level costs
C) customer-sustaining costs
D) customer batch-level costs
Answer: A
Diff: 1
Terms: customer cost hierarchy
Objective: 6
AACSB: Reflective thinking

2) An advantage of using a bar chart to visualize customer profitability is that:
A) differences in commissions paid to sales persons stand out
B) loss customers stand out
C) trends in the volume of purchases become apparent
D) All of these answers are correct.
Answer: B
Diff: 3
Terms: customer-profitability analysis
Objective: 6
AACSB: Reflective thinking
3) Customer actions will LEAST affect:
A) customer output unit-level costs 
B) customer batch-level costs 
C) customer-sustaining costs 
D) distribution-channel costs 
Answer: D 
Diff: 2 
Terms: customer cost hierarchy 
Objective: 6 
AACSB: Reflective thinking 

4) To reduce distribution-channel costs, a company could:
A) improve the efficiency of the ordering process 
B) make fewer customer visits 
C) eliminate distribution to retailers and only service wholesalers 
D) All of these answers are correct. 
Answer: C 
Diff: 3 
Terms: customer-profitability analysis 
Objective: 6 
AACSB: Reflective thinking 

5) Corporate-sustaining costs:
A) are common to all individual customers 
B) have a clear cause-and-effect relationship with several cost-allocation bases 
C) should be allocated for decisions regarding reducing customer costs 
D) All of these answers are correct. 
Answer: A 
Diff: 3 
Terms: customer cost hierarchy 
Objective: 6 
AACSB: Reflective thinking 

6) The allocation of corporate-sustaining costs is useful for:
A) evaluating the performance of salespersons with individual customer accounts 
B) motivating distribution-channel management 
C) focusing on the cause-and-effect relationships with the cost-allocation bases 
D) None of these answers is correct. 
Answer: D 
Diff: 3 
Terms: customer cost hierarchy 
Objective: 6 
AACSB: Reflective thinking
7) If deciding whether to eliminate a distribution channel, allocating corporate-sustaining costs to distribution channels:
A) helps define cost reduction possibilities
B) gives the misleading impression of potential cost savings
C) identifies administrative inefficiencies
D) evaluates the effectiveness of sales personnel
Answer: B
Diff: 3
Terms: customer-profitability analysis
Objective: 6
AACSB: Reflective thinking

8) When corporate-sustaining costs are fully allocated to distribution channels, then the sum of the distribution-channel operating incomes is:
A) less than company-wide operating income
B) equal to company-wide operating income
C) greater than company-wide operating income
D) indeterminable
Answer: B
Diff: 3
Terms: customer-profitability analysis, customer cost hierarchy
Objective: 6
AACSB: Reflective thinking

9) Corporate-sustaining costs should be allocated to:
A) motivate changes in customer behavior
B) evaluate distribution-channel managers
C) determine the selling price that will cover all costs
D) identify the most profitable customers
Answer: C
Diff: 3
Terms: cost allocation, customer-profitability analysis, customer cost hierarchy
Objective: 6
AACSB: Reflective thinking

10) A common finding in many studies is that a high percentage of operating income is:
A) contributed by a small number of customers
B) contributed to evenly by most customers
C) the result of high discounting
D) the result of cooperative efforts by many low-volume customers
Answer: A
Diff: 2
Terms: customer-profitability analysis
Objective: 6
AACSB: Reflective thinking
11) Loss-causing customers:
A) should be dropped
B) should be evaluated for ways to become profitable customers
C) should be retained because each customer adds to long-run profitability
D) do not exist because additional customer sales always increase profits
Answer: B
Diff: 3
Terms: customer-profitability analysis
Objective: 6
AACSB: Reflective thinking

12) Customers are more valuable when they are all of the following EXCEPT:
A) well known in the community
B) expected to continue to do business with a company
C) in an industry with high-growth potential
D) require special attention on a regular basis
Answer: D
Diff: 3
Terms: customer-profitability analysis
Objective: 6
AACSB: Reflective thinking

13) Dropping an unprofitable customer will:
A) eliminate long-run costs assigned to that customer
B) eliminate most short-run costs assigned to that customer
C) decrease long-run profitability
D) increase the potential to cross-sell other products that are more desirable
Answer: B
Diff: 3
Terms: customer-profitability analysis
Objective: 6
AACSB: Reflective thinking

14) Other factors that managers should consider in deciding how to allocate resources among customers include:
A) likelihood of customer retention
B) long-run customer profitability
C) potential for sales growth
D) All of these are correct.
Answer: D
Diff: 3
Terms: customer-profitability analysis
Objective: 6
AACSB: Reflective thinking
15) The static budget variance is:
A) the difference between an actual result and the budget amount in the static budget
B) the difference between the budget amount in the static budget and the amount in the flexible budget
C) the difference between an actual result and the flexible budget amount
D) the difference between the static budget amount and the sales volume variance.
Answer:  A
Diff: 3
Terms:  static budget variance
Objective:  6
AACSB:  Reflective thinking

16) More insight into the static-budget variance can be gained by subdividing it into:
A) the sales-mix variance and the sales-quantity variance
B) the market-share variance and the market-size variance
C) the flexible-budget variance and the sales-volume variance
D) a cost hierarchy
Answer:  C
Diff: 1
Terms:  static-budget variance, flexible-budget variance, sales-volume variance
Objective:  6
AACSB:  Reflective thinking

17) The static-budget variance will be favorable when:
A) actual unit sales are less than budgeted unit sales
B) the actual contribution margin is greater than the static-budget contribution margin
C) the actual sales mix shifts toward the less profitable units
D) the composite unit for the actual mix is greater than for the budgeted mix
Answer:  B
Diff: 3
Terms:  static budget variance
Objective:  6
AACSB:  Reflective thinking

18) More insight into the sales-volume variance can be gained by subdividing it into:
A) the sales-mix variance and the sales-quantity variance
B) the market-share variance and the market-size variance
C) the flexible-budget variance and the market-size variance
D) a cost hierarchy
Answer:  A
Diff: 1
Terms:  sales-volume variance
Objective:  6
AACSB:  Reflective thinking
19) The budgeted contribution margin per composite unit for the budgeted mix can be computed by dividing the:
A) total budgeted contribution margin by the actual total units
B) total budgeted contribution margin by the total budgeted units
C) actual total contribution margin by the total actual total units
D) actual total contribution margin by the total budgeted units
Answer: B
Diff: 1
Terms: composite unit
Objective: 6
AACSB: Reflective thinking

20) The sales-mix variance results from a difference between the:
A) actual market share and the budgeted market share
B) actual contribution margin and the budgeted contribution margin
C) budgeted contribution margin per composite unit for the actual mix and the budgeted contribution margin per composite unit for the budgeted mix
D) actual market size in units and the budgeted market size in units
Answer: C
Diff: 2
Terms: sales-mix variance
Objective: 6
AACSB: Reflective thinking

21) The sales-mix variance will be unfavorable when:
A) the actual sales mix shifts toward the less profitable units
B) the composite unit for the actual mix is greater than for the budgeted mix
C) actual unit sales are less than budgeted unit sales
D) the actual contribution margin is greater than the static-budget contribution margin
Answer: A
Diff: 3
Terms: sales-mix variance
Objective: 6
AACSB: Reflective thinking

22) The sales-mix variance will be favorable when:
A) the actual contribution margin is greater than the static-budget contribution margin
B) actual unit sales are less than budgeted unit sales
C) the actual sales mix shifts toward the less profitable units
D) the composite unit for the actual mix is greater than for the budgeted mix
Answer: D
Diff: 3
Terms: sales-mix variance
Objective: 6
AACSB: Reflective thinking
23) An unfavorable sales-mix variance would most likely be caused by:
A) a new competitor providing better service in the high-margin product sector
B) a competitor having distribution problems with high-margin products
C) the company offering low-margin products at a higher price
D) the company experiencing quality-control problems that get negative media coverage of low-margin products
Answer: A  
Diff: 3  
Terms: sales-mix variance  
Objective: 6  
AACSB: Reflective thinking

24) A shift towards a mix of products with a lower contribution margin per unit will most likely result in a(n):
A) unfavorable sales-mix variance
B) unfavorable sales-quantity variance
C) favorable sales-mix variance
D) favorable sales-quantity variance
Answer: A  
Diff: 2  
Terms: sales-mix variance  
Objective: 6  
AACSB: Reflective thinking

25) The sales-quantity variance will be favorable when:
A) budgeted units of all products sold exceed actual units of all products sold
B) actual units of all products sold exceed budgeted units of all products sold
C) the actual sales mix shifts towards the less profitable units
D) the static budget contribution is greater than the actual contribution margin
Answer: B  
Diff: 2  
Terms: sales-quantity variance  
Objective: 6  
AACSB: Reflective thinking

26) The sales-quantity variance will be unfavorable when:
A) the composite unit for the actual mix is greater than for the budgeted mix
B) actual unit sales are less than budgeted unit sales
C) the actual contribution margin is greater than the static-budget contribution margin
D) the actual sales mix shifts toward the less profitable units
Answer: B  
Diff: 3  
Terms: sales-quantity variance  
Objective: 6  
AACSB: Reflective thinking
27) A favorable sales-quantity variance would most likely be caused by:
A) a new competitor providing better service in the high-margin product sector
B) a competitor having distribution problems with high-margin products
C) the company offering low-margin products at a higher price
D) the company experiencing quality-control problems that get negative media coverage of low-margin products
Answer: B
Diff: 3
Terms: sales-quantity variance
Objective: 6
AACSB: Reflective thinking

28) The formula (budgeted contribution margin based on actual units sold of all products at the budgeted mix) - (contribution margin in the static budget) which is based on budgeted units of all products to be sold at budgeted mix) is equal to the:
A) sales-volume variance
B) sales-mix variance
C) sales-quantity variance
D) Both A and B are correct.
Answer: D
Diff: 2
Terms: sales-mix variance
Objective: 6
AACSB: Reflective thinking

29) The sales-quantity variance results from a difference between:
A) the actual sales mix and the budgeted sales mix
B) the actual quantity of units sold and the budgeted quantity of units sales in the static budget
C) actual contribution margin and the budgeted contribution margin
D) actual market size in units and the budgeted market size in units
Answer: B
Diff: 2
Terms: sales-quantity variance
Objective: 6
AACSB: Reflective thinking
Answer the following questions using the information below:

Shanghai Tea Products has an exclusive contract with British Distributors. Calamine and Shanghai are two brands of teas that are imported and sold to retail outlets. The following information is provided for the month of March:

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th></th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Calamine</td>
<td>Shanghai</td>
<td>Calamine</td>
</tr>
<tr>
<td>Sales in pounds</td>
<td>3,400 lbs.</td>
<td>3,600 lbs.</td>
<td>4,000 lbs.</td>
</tr>
<tr>
<td>Price per pound</td>
<td>$2.50</td>
<td>$2.50</td>
<td>$2.00</td>
</tr>
<tr>
<td>Variable cost per pound</td>
<td>1.00</td>
<td>2.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$1.50</td>
<td>$0.50</td>
<td>$1.00</td>
</tr>
</tbody>
</table>

Budgeted and actual fixed corporate-sustaining costs are $1,750 and $2,000, respectively.

30) What is the actual contribution margin for the month?
A) $7,500
B) $8,800
C) $8,500
D) $6,900
Answer: D
Explanation:  D) (3,400 × $1.50) + (3,600 × $0.50) = $6,900
Diff: 2
Terms: contribution margin
Objective: 6
AACSB: Analytical skills

31) What is the contribution margin for the flexible budget?
A) $7,500
B) $8,800
C) $8,500
D) $6,900
Answer: B
Explanation:  B) (3,400 × $1.00) + (3,600 × $1.50) = $8,800
Diff: 2
Terms: flexible budget
Objective: 6
AACSB: Analytical skills

32) For the contribution margin, what is the total static-budget variance?
A) $600 favorable
B) $1,900 unfavorable
C) $1,000 favorable
D) $1,600 unfavorable
Answer: D
Explanation:  D) Variance = [(4,000 × $1.00) + (3,000 × $1.50)] - [(3,400 × $1.50) + (3,600 × $0.50)]
$1,600 unfavorable = $8,500 - $6,900
Diff: 2
Terms: static-budget variance
Objective: 6
AACSB: Analytical skills
33) For the contribution margin, what is the total flexible-budget variance?
A) $300 favorable
B) $1,900 unfavorable
C) $500 favorable
D) $800 unfavorable
Answer: B
Explanation: B) $(3,400 \times 1.50) + (3,600 \times 0.50) = 6,900$
$(3,400 \times 1.00) + (3,600 \times 1.50) = 8,800$
$1,900 unfavorable = 8,800 - 6,900$
Diff: 2
Terms: flexible-budget variance
Objective: 6
AACSB: Analytical skills

Answer the following questions using the information below:

Michelle's Flowering Plants provides the following information for the month of May:

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Tulips</td>
<td>Geraniums</td>
</tr>
<tr>
<td>Sales in units</td>
<td>3,900</td>
<td>3,600</td>
</tr>
<tr>
<td>Contribution</td>
<td>$11</td>
<td>$18</td>
</tr>
<tr>
<td>margin per unit</td>
<td>$10</td>
<td>$20</td>
</tr>
</tbody>
</table>

34) What is the budgeted contribution margin per composite unit for the actual mix?
A) $13.80
B) $14.00
C) $14.36
D) $14.80
Answer: D
Explanation: D) $[10 \times (3,900 / (3,900 + 3,600))] + [20 \times (3,600) / (3,900 + 3,600))] = 14.80
Diff: 2
Terms: composite unit
Objective: 6
AACSB: Analytical skills

35) What is the budgeted contribution margin per composite unit for the budgeted mix?
A) $13.80
B) $14.00
C) $14.36
D) $14.80
Answer: B
Explanation: B) $[10 \times (4,500) / (4,500 + 3,000))] + [20 \times (3,000) / (4,500 + 3,000))] = 14.00
Diff: 2
Terms: composite unit
Objective: 6
AACSB: Analytical skills
36) For May, Michelle will report a(n):
A) favorable sales-mix variance
B) unfavorable sales-mix variance
C) favorable sales-volume variance
D) unfavorable sales-volume variance
Answer: A
Explanation: A) \[10 \times \frac{(3,900)}{(3,900 + 3,600)} + 20 \times \frac{(3,600)}{(3,900 + 3,600)}\] = $14.80
\[10 \times \frac{(4,500)}{(4,500 + 3,000)} + 20 \times \frac{(3,000)}{(4,500 + 3,000)}\] = $14.00
Diff: 2
Terms: sales-mix variance
Objective: 6
AACSB: Analytical skills

Answer the following questions using the information below:

Woodruff Flowering Plants provides the following information for the month of May:

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales in units</td>
<td>Fuchsia Dogwood</td>
<td>Fuchsia Dogwood</td>
</tr>
<tr>
<td></td>
<td>20,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Contribution margin per unit</td>
<td>$18</td>
<td>$14</td>
</tr>
<tr>
<td></td>
<td>16,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Contribution margin per unit</td>
<td>$20</td>
<td>$16</td>
</tr>
</tbody>
</table>

37) What is the budgeted contribution margin per composite unit for the actual mix?
A) $8.00
B) $8.60
C) $9.00
D) $9.60
Answer: D
Explanation: D) \[20 \times \frac{(20,000)}{(20,000 + 5,000)} + 16 \times \frac{(5,000)}{(20,000 + 5,000)}\] = $9.60
Diff: 2
Terms: composite unit
Objective: 6
AACSB: Analytical skills

38) What is the budgeted contribution margin per composite unit for the budgeted mix?
A) $8.00
B) $8.60
C) $9.00
D) $9.60
Answer: D
Explanation: D) \[20 \times \frac{(16,000)}{(16,000 + 4,000)} + 16 \times \frac{(4,000)}{(16,000 + 4,000)}\] = $9.60
Diff: 2
Terms: composite unit
Objective: 6
AACSB: Analytical skills
39) For May, Woodruff will report a(n):
A) favorable sales-mix variance
B) unfavorable sales-mix variance
C) favorable sales-volume variance
D) unfavorable sales-volume variance
Answer: C
Diff: 3
Terms: sales-volume variance
Objective: 6
AACSB: Analytical skills

Answer the following questions using the information below:

The XTRA Appliance Manufacturing Corporation manufactures two vacuum cleaners, the Standard and the Super. The following information was gathered about the two products:

<table>
<thead>
<tr>
<th></th>
<th>Standard</th>
<th>Super</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted sales in units</td>
<td>3,200</td>
<td>800</td>
</tr>
<tr>
<td>Budgeted selling price</td>
<td>$600</td>
<td>$1,700</td>
</tr>
<tr>
<td>Budgeted contribution margin per unit</td>
<td>$420</td>
<td>$1,100</td>
</tr>
<tr>
<td>Actual sales in units</td>
<td>3,500</td>
<td>1,500</td>
</tr>
<tr>
<td>Actual selling price</td>
<td>$650</td>
<td>$1,680</td>
</tr>
</tbody>
</table>

40) What is the budgeted sales-mix percentage for the Standard and the Super vacuum cleaners, respectively?
A) 0.80 and 0.20
B) 0.70 and 0.30
C) 0.20 and 0.80
D) 0.30 and 0.70
Answer: A
Explanation: A) 3,200 / (3,200 + 800) = 0.80 and 800 / (3,200 + 800) = 0.20
Diff: 1
Terms: sales-mix variance
Objective: 6
AACSB: Analytical skills

41) What is the total sales-volume variance in terms of the contribution margin?
A) $216,000 unfavorable
B) $216,000 favorable
C) $556,000 favorable
D) $896,000 favorable
Answer: D
Explanation: D) Standard= (3,500 - 3,200) × $420 = $ 126,000 F
Super = (1,500 - 800) × $1,100 = $770,000 F + $896,000 F
Diff: 2
Terms: sales-volume variance
Objective: 6
AACSB: Analytical skills
42) What is the total sales-quantity variance in terms of the contribution margin?
A) $220,000 favorable
B) $340,000 favorable
C) $556,000 favorable
D) $896,000 favorable
Answer: C
Explanation:
C)  Standard = (5,000 - 4,000) × .8 × $420 = $336,000 F
Super = (5,000 - 4,000) × .2 × $1,100 = 220,000 F
$556,000 F
Diff: 2
Terms: sales-quantity variance
Objective: 6
AACSB: Analytical skills

43) What is the total sales-mix variance in terms of the contribution margin?
A) $220,000 favorable
B) $340,000 favorable
C) $556,000 favorable
D) $896,000 favorable
Answer: B
Explanation:
B) Standard = (5,000 - 4,000) × .8 × $420 = $336,000 F
Super = (5,000 - 4,000) × .2 × $1,100 = 220,000 F
$556,000 F
Standard = 5,000 × (.7 - .8) × $420 = $210,000 U
Super = 5,000 × (.3 - .2) × $1,100 = $550,000 F
$340,000 F
Diff: 2
Terms: sales-mix variance
Objective: 6
AACSB: Analytical skills

Answer the following questions using the information below:
The Sarasota Corporation manufactures two types of vacuum cleaners, the Victor for commercial building use and the House-Mate for residences. Budgeted and actual operating data for the year 2012 were as follows:

<table>
<thead>
<tr>
<th>Static Budget</th>
<th>Victor</th>
<th>House-Mate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number sold</td>
<td>5,000</td>
<td>20,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$1,500,000</td>
<td>$3,000,000</td>
<td>$4,500,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Actual Results</th>
<th>Victor</th>
<th>House-Mate</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number sold</td>
<td>4,000</td>
<td>28,000</td>
<td>32,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$1,280,000</td>
<td>$3,920,000</td>
<td>$5,200,000</td>
</tr>
</tbody>
</table>

44) What is the contribution margin for the flexible budget?
A) $1,200,000
B) $4,200,000
C) $5,200,000
D) $5,400,000
Answer: D
Explanation: D) Budgeted contribution margin per unit:
Victor = $1,500,000/5,000 = $300
House-Mate = $3,000,000/20,000 = $150
Flexible-budget contribution margin:
4,000 × $300 = $1,200,000
28,000 × $150 = 4,200,000
$5,400,000

45) What is the total static-budget variance in terms of the contribution margin?
A) $900,000 favorable
B) $700,000 favorable
C) $200,000 unfavorable
D) $360,000 unfavorable
Answer: B
Explanation: B) $700,000 favorable = $4,500,000 - $5,200,000
Diff: 1
Terms: static-budget variance
Objective: 6
AACSB: Analytical skills
46) What is the total flexible-budget variance in terms of the contribution margin?
A) $900,000 favorable
B) $700,000 favorable
C) $200,000 unfavorable
D) $360,000 unfavorable
Answer: C
Explanation: C) Budgeted contribution margin per unit:
Victor = $1,500,000/5,000 = $300    House-Mate = $3,000,000/20,000 = $150
Flexible-budget contribution margin: 4,000 × $300 = $1,200,000
28,000 × $150 = 4,200,000
$5,400,000

$200,000 unfavorable = $5,400,000 - $5,200,000
Diff: 2
Terms: flexible-budget variance
Objective: 6
AACSB: Analytical skills

47) What is the total sales-volume variance in terms of the contribution margin?
A) $900,000 favorable
B) $1,260,000 favorable
C) $200,000 unfavorable
D) $360,000 unfavorable
Answer: A
Explanation: A) Budgeted contribution margin per unit:
Victor = $1,500,000/5,000 = $300    House-Mate = $3,000,000/20,000 = $150
Flexible-budget contribution margin: 4,000 × $300 = $1,200,000
28,000 × $150 = 4,200,000
$5,400,000

$900,000 favorable = $4,500,000 - $5,400,000
Diff: 2
Terms: sales-volume variance
Objective: 6
AACSB: Analytical skills
48) What is the total sales-quantity variance in terms of the contribution margin?
A) $200,000 unfavorable
B) $900,000 favorable
C) $360,000 unfavorable
D) $1,260,000 favorable
Answer: D
Explanation:
D) **Budgeted sales-mix percentage:**
Victor = 5,000/25,000 = 0.20  House-Mate = 20,000/25,000 = 0.80
**Actual sales-mix percentage:**
Victor = 4,000/32,000 = 0.125  House-Mate = 28,000/32,000 = 0.875

<table>
<thead>
<tr>
<th>Sales-quantity variance</th>
<th>Actual units of all products sold - Budgeted units of all products sold</th>
<th>Budgeted sales-mix %</th>
<th>Budgeted CM per unit</th>
<th>Sales-quantity variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victor</td>
<td>(32,000 - 25,000) × 0.20 × $300</td>
<td>= $420,000 F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>House-Mate</td>
<td>(32,000 - 25,000) × 0.80 × $150</td>
<td>= $840,000 F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>$1,260,000 F</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Diff: 3
Terms: sales-quantity variance
Objective: 6
AACSB: Analytical skills

49) What is the total sales-mix variance in terms of the contribution margin?
A) $200,000 unfavorable
B) $360,000 unfavorable
C) $900,000 favorable
D) $1,260,000 favorable
Answer: B
Explanation: B)

<table>
<thead>
<tr>
<th>Sales-mix variance</th>
<th>Actual units of all products sold</th>
<th>Actual sales-mix % - Budgeted sales-mix%</th>
<th>Budgeted CM per unit</th>
<th>Sales-mix variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victor</td>
<td>32,000 × (0.125 - 0.200) × $300</td>
<td>= $720,000 F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>House-Mate</td>
<td>32,000 × (0.875 - 0.800) × $150</td>
<td>= $360,000 U</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>$360,000 U</td>
<td></td>
</tr>
</tbody>
</table>

Diff: 3
Terms: sales-mix variance
Objective: 6
AACSB: Analytical skills
50) The static-budget variance is the difference between an actual result and a budgeted amount in the static budget.
Answer: TRUE
Diff: 1
Terms: static budget variance
Objective: 6
AACSB: Reflective thinking

51) The flexible-budget variance is the difference between an actual result and the flexible-budget amount based on the level of output actually achieved in the budget period.
Answer: TRUE
Diff: 1
Terms: flexible-budget variance
Objective: 6
AACSB: Reflective thinking

52) Managers can gain more insight about the static-budget variance by subdividing it into the flexible-budget variance and the sales-volume variance.
Answer: TRUE
Diff: 1
Terms: static budget variance
Objective: 6
AACSB: Reflective thinking

53) Additional insight can be gained by dividing the sales-mix variance into the flexible-budget variance and the sales-volume variance.
Answer: FALSE
Explanation: Additional insight can be gained by dividing the static-budget variance into the flexible-budget variance and the sales-volume variance.
Diff: 1
Terms: static budget variance, flexible budget variance, sales-volume variance
Objective: 6
AACSB: Reflective thinking

54) A favorable sales-mix variance arises when the actual sales-mix percentage exceeds the budgeted sales-mix percentage.
Answer: TRUE
Explanation: A favorable sales-mix variance arises when the actual sales-mix percentage exceeds the budgeted sales-mix percentage.
Diff: 3
Terms: sales-mix variance
Objective: 6
AACSB: Reflective thinking

55) A composite unit is a hypothetical unit with weights based on the mix of individual units.
Answer: TRUE
Diff: 1
Terms: composite unit
Objective: 6
AACSB: Reflective thinking
56) The sales-mix variance can be explained in terms of the budgeted contribution margin per composite unit of the sales mix.
Answer: TRUE
Diff: 2
Terms: sales-mix variance, composite unit
Objective: 6
AACSB: Reflective thinking

57) The sales-quantity variance is favorable when budgeted unit sales exceed actual unit sales.
Answer: FALSE
Explanation: The sales-quantity variance is unfavorable when budgeted unit sales exceed actual unit sales.
Diff: 3
Terms: sales-quantity variance
Objective: 6
AACSB: Reflective thinking

58) The sales mix variance is the difference between budgeted contribution margin for the actual sales mix and the budgeted contribution margin for the budgeted sales mix.
Answer: TRUE
Diff: 2
Terms: sales mix variance
Objective: 6
AACSB: Reflective thinking

59) The sales quantity variance is the difference between budgeted contribution margin based on actual units sold of all products at the budgeted mix, and contribution margin in the flexible budget.
Answer: FALSE
Explanation: The sales quantity variance is the difference between budgeted contribution margin based on actual units sold of all products at the budgeted mix, and contribution margin in the static budget.
Diff: 2
Terms: sales quantity variance
Objective: 6
AACSB: Reflective thinking
60) Aromatic Coffee, Inc., sells two types of coffee, Colombian and Blue Mountain. The monthly budget for U.S. coffee sales is based on a combination of last year's performance, a forecast of industry sales, and the company's expected share of the U.S. market. The following information is provided for March:

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Colombian</td>
<td>Blue Mountain</td>
</tr>
<tr>
<td>Sales in pounds</td>
<td>14,000 lbs.</td>
<td>16,000 lbs.</td>
</tr>
<tr>
<td>Price per pound</td>
<td>$12.50</td>
<td>$15.00</td>
</tr>
<tr>
<td>Variable cost per pound</td>
<td>5.50</td>
<td>7.00</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$7.00</td>
<td>$8.00</td>
</tr>
</tbody>
</table>

Budgeted and actual fixed corporate-sustaining costs are $60,000 and $72,000, respectively.

**Required:**

a. Calculate the actual contribution margin for the month.

b. Calculate the contribution margin for the static budget.

c. Calculate the contribution margin for the flexible budget.

d. Determine the total static-budget variance, the total flexible-budget variance, and the total sales-volume variance in terms of the contribution margin.

**Answer:**

a. Actual contribution margin: 
   \[ 14,000 \times 7 = 98,000 \]
   \[ 16,000 \times 8 = 128,000 \]
   \[ \$226,000 \]

b. Static-budget contribution margin: 
   \[ 12,800 \times 6.50 = 83,200 \]
   \[ 17,200 \times 8.50 = 146,200 \]
   \[ \$229,400 \]

c. Flexible-budget contribution margin: 
   \[ 14,000 \times 6.50 = 91,000 \]
   \[ 16,000 \times 8.50 = 136,000 \]
   \[ \$227,000 \]

d. Static-budget variance is $3,400 unfavorable = $229,400 - $226,000
   Flexible-budget variance is $1,000 unfavorable = $227,000 - $226,000
   Sales-volume variance is $2,400 unfavorable = $229,400 - $227,000

Diff: 2

Terms: contrib margin, static-budget var, flexible-budget var, sales vol var

Objective: 6

AACSB: Analytical skills
61) Richard's Electronics manufactures TVs and DVDRs. During April, the following activities occurred:

<table>
<thead>
<tr>
<th></th>
<th>TVs</th>
<th>DVDRs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Budgeted units sold</td>
<td>17,640</td>
<td>66,360</td>
</tr>
<tr>
<td>Budgeted contribution margin per unit</td>
<td>$45</td>
<td>$78</td>
</tr>
<tr>
<td>Actual units sold</td>
<td>20,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Actual contribution margin per unit</td>
<td>$50</td>
<td>$79</td>
</tr>
</tbody>
</table>

**Required:**

Compute the following variances in terms of the contribution margin.

a. Determine the total sales-mix variance.

b. Determine the total sales-quantity variance.

c. Determine the total sales-volume variance.

**Answer:**

a. TVs 
\[
[(100,000 \times 0.20) \times 45] = 900,000
\]
\[
[(100,000 \times 0.21) \times 45] = 945,000
\]
\[
75,000 \text{ unfavorable}
\]

DVDRs
\[
[(100,000 \times 0.80) \times 78] = 6,240,000
\]
\[
(100,000 \times 0.79) \times 78] = 6,162,000
\]
\[
78,000 \text{ favorable}
\]

**Total sales-mix variance = $90,000 unfavorable + $156,000 favorable = $66,000 favorable.**

b. TVs
\[
[[(100,000 - 84,000) \times 0.21] \times 45] = 151,200 \text{ favorable}
\]

DVDRs
\[
[[(100,000 - 84,000) \times 0.79] \times 78] = 985,920 \text{ favorable}
\]

**Total sales-quantity variance = $1,137,120 favorable.**

c. Total sales-volume variance = $33,000 favorable + $1,137,120 favorable = $1,170,120 favorable

**Diff: 3**

Terms: sales-volume variance, sales-mix variance, sales-quantity variance

Objective: 6

AACSB: Analytical skills
The Omega Corporation manufactures two types of vacuum cleaners: the ZENITH for commercial building use and the House-Helper for residences. Budgeted and actual operating data for the year 20X5 are as follows:

<table>
<thead>
<tr>
<th>Static Budget</th>
<th>ZENITH</th>
<th>House-Helper</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number sold</td>
<td>15,000</td>
<td>60,000</td>
<td>75,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$3,750,000</td>
<td>$12,000,000</td>
<td>$15,750,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Actual Results</th>
<th>ZENITH</th>
<th>House-Helper</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number sold</td>
<td>16,500</td>
<td>38,500</td>
<td>55,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$6,200,000</td>
<td>$10,200,000</td>
<td>$16,400,000</td>
</tr>
</tbody>
</table>

**Required:**

a. Calculate the contribution margin for the flexible budget.
b. Determine the total static-budget variance, the total flexible-budget variance, and the total sales-volume variance in terms of the contribution margin.

**Answer:**

**Budgeted contribution margin per unit:**

- ZENITH = $3,750,000/15,000 = $250
- House-Helper = $12,000,000/60,000 = $200

a. Flexible-budget contribution margin:

- ZENITH: 16,500 × $250 = $4,125,000
- House-Helper: 38,500 × $200 = $7,700,000

Total = $11,825,000

b. Static-budget variance is $650,000 favorable = $15,750,000 - $16,400,000

Flexible-budget variance is $4,575,000 favorable = $11,825,000 - $16,400,000

Sales-volume variance is $3,925,000 unfavorable = $15,750,000 - $11,825,000

**Diff:** 2

Terms: contrib margin, static-budget var, flexible-budget var, sales vol var

Objective: 6

AACSB: Analytical skills
63) The Omega Corporation manufactures two types of vacuum cleaners: the ZENITH for commercial building use and the House-Helper for residences. Budgeted and actual operating data for the year 20X5 are as follows:

<table>
<thead>
<tr>
<th>Static Budget</th>
<th>ZENITH</th>
<th>House-Helper</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number sold</td>
<td>15,000</td>
<td>60,000</td>
<td>75,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$3,750,000</td>
<td>$12,000,000</td>
<td>$15,750,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Actual Results</th>
<th>ZENITH</th>
<th>House-Helper</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number sold</td>
<td>16,500</td>
<td>38,500</td>
<td>55,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$6,200,000</td>
<td>$10,200,000</td>
<td>$16,400,000</td>
</tr>
</tbody>
</table>

Required:
Compute the sales-mix variance and the sales-quantity variance by type of vacuum cleaner, and in total. (in terms of the contribution margin)

Answer:

Budgeted sales-mix percentage:
ZENITH = 15,000/75,000 = 20%  House-Helper = 60,000/75,000 = 80%

Actual sales-mix percentage:
ZENITH = 16,500/55,000 = 30%  House-Helper = 38,500/55,000 = 70%

Budgeted contribution margin per unit:
ZENITH = $3,750,000/15,000 = $250  House-Helper = $12,000,000/60,000 = $200

<table>
<thead>
<tr>
<th>Sales-mix variance</th>
<th>Actual units of all products sold</th>
<th>Actual sales-mix % - Budgeted sales-mix %</th>
<th>Budgeted CM per unit</th>
<th>Sales-mix variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZENITH</td>
<td>55,000 ×</td>
<td>(0.3 - 0.2) ×</td>
<td>$250</td>
<td>= $1,375,000 F</td>
</tr>
<tr>
<td>House-Helper</td>
<td>55,000 ×</td>
<td>(0.7 - 0.8) ×</td>
<td>$200</td>
<td>= $1,100,000 U</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>$ 275,000 F</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Sales-quantity variance</th>
<th>Actual units of all products sold - Budgeted units of all products sold</th>
<th>Budgeted sales-mix %</th>
<th>Budgeted CM per unit</th>
<th>Sales-quantity variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZENITH</td>
<td>(55,000 - 75,000) ×</td>
<td>0.2 ×</td>
<td>$250</td>
<td>= $1,000,000 U</td>
</tr>
<tr>
<td>House-Helper</td>
<td>(55,000 - 75,000) ×</td>
<td>0.8 ×</td>
<td>$200</td>
<td>= $3,200,000 U</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>$4,200,000 U</td>
</tr>
</tbody>
</table>

Diff: 3
Terms: sales-mix variance, sales-quantity variance
Objective: 6
AACSB: Analytical skills
The Chair Company manufactures two modular types of chairs: one for the residential market, and the other for the office market. Budgeted and actual operating data for the year 2012 are:

<table>
<thead>
<tr>
<th>Static Budget</th>
<th>Residential</th>
<th>Office</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of chairs sold</td>
<td>260,000</td>
<td>140,000</td>
<td>400,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$26,000,000</td>
<td>$11,200,000</td>
<td>$37,200,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Actual Results</th>
<th>Residential</th>
<th>Office</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of chairs sold</td>
<td>248,400</td>
<td>165,600</td>
<td>414,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$22,356,000</td>
<td>$13,248,000</td>
<td>$35,604,000</td>
</tr>
</tbody>
</table>

**Required:**
Compute the following variances in terms of contribution margin:

a. Compute the total static-budget variance, the total flexible-budget variance, and the total sales-volume variance.

b. Compute the sale-mix variance and the sales-quantity variance by type of chair, and in total.

**Answer:**

a. **Budgeted contribution margin per unit:**
   - Residential = $26,000,000/260,000 = $100
   - Office = $11,200,000/140,000 = $80

   **Flexible-budget contribution margin:**
   - Residential = 248,400 × $100 = $24,840,000
   - Office = 165,600 × $80 = $13,248,000
   - $38,088,000

   Static-budget variance is $1,596,000 unfavorable
   - $37,200,000 - $35,604,000

   Sales-volume variance is $888,000 favorable
   - $37,200,000 - $38,088,000

   Flexible-budget variance is $2,484,000 unfavorable
   - $38,088,000 - $35,604,000

b. **Actual sales-mix percentage:**
   - Residential = 248,400/414,000 = 60%
   - Office = 165,600/414,000 = 40%

   **Budgeted sales-mix percentage:**
   - Residential = 260,000/400,000 = 65%
   - Office = 140,000/400,000 = 35%
Sales-mix variance

<table>
<thead>
<tr>
<th></th>
<th>Actual units of all products sold</th>
<th>Actual sales-mix % - Budgeted sales-mix %</th>
<th>Budgeted CM per unit</th>
<th>Sales-mix variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>414,000 ×</td>
<td>(0.6 - 0.65) ×</td>
<td>$100</td>
<td>$2,070,000 U</td>
</tr>
<tr>
<td>Office</td>
<td>414,000 ×</td>
<td>(0.4 - 0.35) ×</td>
<td>$80</td>
<td>$1,656,000 F</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>$ 414,000 U</td>
</tr>
</tbody>
</table>

Sales-quantity variance

<table>
<thead>
<tr>
<th></th>
<th>Actual units of all products sold - Budgeted units of all products sold</th>
<th>Budgeted sales-mix %</th>
<th>Budgeted CM per unit</th>
<th>Sales-quantity variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>(414,000 - 400,000) ×</td>
<td>0.65 ×</td>
<td>$100</td>
<td>$ 910,000 F</td>
</tr>
<tr>
<td>Office</td>
<td>(414,000 - 400,000) ×</td>
<td>0.35 ×</td>
<td>$80</td>
<td>$ 392,000 F</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>$1,302,000 F</td>
</tr>
</tbody>
</table>

65) Why would a manager perform customer-profitability analysis?
Answer: Customer profitability analysis highlights how individual customers contribute to profitability. It helps managers determine whether customers who are contributing significantly to profits are receiving a comparable level of attention from the organization.

66) What actions might be taken with an unprofitable customer?
Answer: An unprofitable customer might be dropped as a customer, might be charged more for some of the resources of the company that it is using in excess of other customers, or he/she might be counseled on how to use less resources and be restored to profitability in the future.
Objective 14.A

1) More insight into the flexible-budget variance for direct materials can be gained by subdividing it into the direct materials:
   A) mix and volume variances
   B) market-share and market-size variances
   C) mix and yield variances
   D) price and efficiency variances
   Answer:  D
   Diff: 2
   Terms: direct material price variance, direct material efficiency variance
   Objective:  A
   AACSB: Reflective thinking

2) More insight into the efficiency variance for direct materials can be gained by subdividing it into the direct materials:
   A) mix and volume variances
   B) market-share and market-size variances
   C) mix and yield variances.
   D) price and efficiency variances
   Answer:  C
   Diff: 2
   Terms: direct materials mix variance, direct materials yield variance
   Objective:  A
   AACSB: Reflective thinking

3) The direct materials mix variance will be favorable when:
   A) the flexible-budget contribution margin is greater than the actual contribution margin
   B) the actual direct materials input mix is less expensive than the budgeted direct materials input mix
   C) the actual quantity of total inputs used is greater than the flexible budget for total inputs
   D) actual unit sales are less than budgeted unit sales
   Answer:  B
   Diff: 2
   Terms: direct materials mix variance
   Objective:  A
   AACSB: Reflective thinking

4) The materials yield variance will be unfavorable when:
   A) the flexible-budget contribution margin is greater than the actual contribution margin
   B) the actual direct materials input mix is less expensive than the budgeted direct materials input mix
   C) the actual quantity of total inputs used is greater than the flexible budget for total inputs
   D) actual unit sales are less than budgeted unit sales
   Answer:  C
   Diff: 2
   Terms: direct materials yield variance
   Objective:  A
   AACSB: Reflective thinking
5) The direct materials mix variance is the:
A) average of the direct materials mix variances for each input
B) sum of the direct materials mix variances for each input
C) difference between the direct materials mix variances for each input
D) multiple of the direct materials mix variances for each input
Answer: B
Diff: 2
Terms: direct materials mix variance
Objective: A
AACSB: Reflective thinking

6) The direct materials mix variance is the sum of the direct materials mix variances for each input.
Answer: TRUE
Diff: 1
Terms: direct materials mix variance
Objective: A
AACSB: Reflective thinking

7) A favorable direct materials mix variance results when more expensive direct materials are substituted for less expensive direct materials.
Answer: FALSE
Explanation: A favorable direct materials mix variance results when less expensive direct materials are substituted for more expensive direct materials.
Diff: 2
Terms: direct materials mix variance
Objective: A
AACSB: Ethical reasoning

8) A favorable direct materials yield variance results when less direct materials are used than planned.
Answer: TRUE
Diff: 2
Terms: direct materials mix variance, direct materials yield variance
Objective: A
AACSB: Reflective thinking
Objective 15.1

1) The method that allocates costs in each cost pool using the same rate per unit is known as the:
A) incremental cost-allocation method
B) reciprocal cost-allocation method
C) single-rate cost allocation method
D) dual-rate cost-allocation method
Answer: C
Diff: 2
Terms: single-rate cost-allocation method
Objective: 1
AACSB: Reflective thinking

2) The dual-rate cost-allocation method classifies costs in each cost pool into a:
A) budgeted-cost pool and an actual-cost pool
B) variable-cost pool and a fixed-cost pool
C) used-capacity-cost pool and a practical-capacity-cost pool
D) direct-cost pool and a reciprocal-cost pool
Answer: B
Diff: 1
Terms: dual-rate cost-allocation method
Objective: 1
 AACSB: Reflective thinking

3) The single-rate cost-allocation method may base the denominator choice on:
A) master-budget capacity utilization
B) normal capacity utilization
C) practical capacity
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: single-rate cost-allocation method
Objective: 1
AACSB: Reflective thinking

4) When using the single-rate method, fixed cost allocation may be based on:
A) actual usage
B) budgeted usage
C) incremental cost allocation
D) Either A or B are correct.
Answer: D
Diff: 1
Terms: single-rate cost-allocation method
Objective: 1
AACSB: Reflective thinking
5) Benefits of the single-rate method include:
   A) it is easier to calculate
   B) fixed costs that are transformed into variable costs for user decision making
   C) signals regarding how variable and fixed costs behave differently
   D) information that leads to outsourcing decisions that benefit the organization as a whole
   Answer: A
   Diff: 3
   Terms: single-rate cost-allocation method
   Objective: 1
   AACSB: Reflective thinking

6) Benefits of the dual-rate method include:
   A) variable costs that are transformed into fixed costs for user decision making
   B) the low cost of implementation
   C) avoidance of expensive analysis for categorizing costs as either fixed or variable
   D) information that leads to outsourcing decisions that benefit the organization as a whole
   Answer: D
   Diff: 3
   Terms: dual-rate cost-allocation method
   Objective: 1
   AACSB: Reflective thinking

7) The advantage of using practical capacity to allocate costs:
   A) is that it allows a downward demand spiral to develop
   B) is that it focuses management's attention on managing unused capacity
   C) is that budgets are much easier to develop
   D) Either A or B are correct.
   Answer: B
   Diff: 3
   Terms: support department
   Objective: 1
   AACSB: Reflective thinking
Answer the following questions using the information below:

The Charmatz Corporation has a central copying facility. The copying facility has only two users, the Marketing Department and the Operations Department. The following data apply to the coming budget year:

**Budgeted costs of operating the copying facility**
for 400,000 to 600,000 copies:

- Fixed costs per year: $60,000
- Variable costs: 3 cents (.03) per copy

**Budgeted long-run usage in copies per year:**
- Marketing Department: 120,000 copies
- Operations Department: 380,000 copies

Budgeted amounts are used to calculate the allocation rates.

Actual usage for the year by the Marketing Department was 80,000 copies and by the Operations Department was 360,000 copies.

8) If a single-rate cost-allocation method is used, what amount of copying facility costs will be **budgeted** for the Marketing Department?
   
   A) $18,000  
   B) $3,600  
   C) $14,400  
   D) $16,800  
   
   Answer: A  
   Explanation:  
   A) \[
   \frac{120,000}{120,000 + 380,000} \times 60,000 + (120,000 \times 0.03) = 18,000
   \]
   Diff: 2  
   Terms: single-rate cost-allocation method  
   Objective: 1  
   AACSB: Analytical skills

9) If a single-rate cost-allocation method is used, what amount of copying facility costs will be **allocated** to the Marketing Department? Assume actual usage is used to allocate copying costs.
   
   A) $16,800  
   B) $18,000  
   C) $12,000  
   D) $9,600  
   
   Answer: C  
   Explanation:  
   C) \[
   \frac{120,000}{120,000 + 380,000} \times 60,000 + (120,000 \times 0.03) = 18,000
   \]
   \[
   18,000 \times 80,000 = 1,440,000
   \]
   Diff: 3  
   Terms: single-rate cost-allocation method  
   Objective: 1  
   AACSB: Analytical skills
10) If a dual-rate cost-allocation method is used, what amount of copying facility costs will be budgeted for the Operations Department?
A) $57,000
B) $56,400
C) $60,490
D) $59,890
Answer: A
Explanation: A) \( \left( \frac{380,000}{120,000 + 380,000} \right) \times 60,000 \) + \( 380,000 \times 0.03 \) = $57,000
Diff: 2
Terms: dual-rate cost-allocation method
Objective: 1
AACSB: Analytical skills

11) If a dual-rate cost-allocation method is used, what amount of copying facility costs will be allocated to the Operations Department? Assume budgeted usage is used to allocate fixed copying costs and actual usage is used to allocate variable copying costs.
A) $60,490
B) $59,890
C) $57,000
D) $56,400
Answer: D
Explanation: D) \( \left( \frac{380,000}{120,000 + 380,000} \right) \times 60,000 \) + \( 360,000 \times 0.03 \) = $56,400
Diff: 3
Terms: dual-rate cost-allocation method
Objective: 1
AACSB: Analytical skills
Answer the following questions using the information below:

The Quickjet Aircraft Corporation has a central materials laboratory. The laboratory has only two users, the Large Plane Department and the Small Plane Department. The following data apply to the coming budget year:

Budgeted costs of operating the materials laboratory
for 100,000 to 200,000 technician hours per year:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed costs per year</td>
<td>$6,000,000</td>
</tr>
<tr>
<td>Variable costs</td>
<td>$80 per technician hour</td>
</tr>
</tbody>
</table>

Budgeted long-run usage in hours per year:

<table>
<thead>
<tr>
<th>Department</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large Plane Department</td>
<td>90,000</td>
</tr>
<tr>
<td>Small Plane Department</td>
<td>70,000</td>
</tr>
</tbody>
</table>

Budgeted amounts are used to calculate the allocation rates.

Actual usage for the year by the Large Plane Department was 60,000 technician hours and by the Small Plane Department was 65,000 technician hours.

12) If a single-rate cost-allocation method is used, what is the allocation rate per hour used?
   A) $80.00
   B) $117.50
   C) $146.67
   D) $100.00
   Answer: B
   Explanation: B) \( \frac{($6,000,000 + ($160,000 \times $80))}{160,000 \text{ hours}} = $117.50/ \text{ per hour used} \)
   Diff: 2
   Terms: single-rate cost-allocation method
   Objective: 1
   AACSB: Analytical skills

13) If a dual-rate cost-allocation method is used, what amount of materials laboratory costs will be budgeted for the Large Plane Department?
   A) $10,575,000
   B) $8,225,000
   C) $18,800,000
   D) $16,000,000
   Answer: A
   Explanation: A) \( \frac{90,000}{(90,000 + 70,000)} \times $6,000,000 + (90,000 \times $80) = $10,575,000 \)
   Diff: 2
   Terms: dual-rate cost-allocation method
   Objective: 1
   AACSB: Analytical skills
14) If a single-rate cost-allocation method is used, what amount of materials laboratory costs will be allocated to the Large Plane Department? Assume actual usage is used to allocate copying costs.

A) $10,575,000
B) $8,225,000
C) $7,637,500
D) $7,050,000

Answer: D
Explanation: D) \( \frac{($6,000,000 + (160,000 \text{ hours} \times $80))}{160,000 \text{ hours}} = $117.50/ \text{ per hour used} \)
\( $117.50 \text{ per hour} \times 60,000 = $7,050,000 \)
Diff: 3
Terms: single-rate cost-allocation method
Objective: 1
AACSB: Analytical skills

15) If a dual-rate cost-allocation method is used, what amount of materials laboratory costs will be allocated to the Large Plane Department? Assume budgeted usage is used to allocate fixed materials laboratory costs and actual usage is used to allocate variable materials laboratory costs.

A) $7,825,000
B) $8,175,000
C) $8,225,000
D) $7,050,000

Answer: B
Explanation: B) \( \left[\frac{90,000}{90,000 +70,000}\right] \times $6,000,000 + (60,000 \times $80) = $8,175,000 \)
Diff: 3
Terms: dual-rate cost-allocation method
Objective: 1
AACSB: Analytical skills

16) If a dual-rate cost-allocation method is used, what amount of materials laboratory costs will be budgeted for the Small Plane Department?

A) $10,575,000
B) $7,637,500
C) $7,050,000
D) $8,225,000

Answer: D
Explanation: D) \( \left[\frac{70,000}{90,000 +70,000}\right] \times $6,000,000 + (70,000 \times $80) = $8,225,000 \)
Diff: 2
Terms: dual-rate cost-allocation method
Objective: 1
AACSB: Analytical skills
17) If a dual-rate cost-allocation method is used, what amount of materials laboratory costs will be allocated to the Small Plane Department? Assume budgeted usage is used to allocate materials laboratory costs and actual usage is used to allocate variable materials laboratory costs.
A) $8,225,000
B) $7,825,000
C) $8,175,000
D) $7,637,500
Answer: B
Explanation: B) \[ \frac{70,000}{90,000 + 70,000} \times 6,000,000 + (65,000 \times 80) = 7,825,000 \]
Diff: 3
Terms: dual-rate cost-allocation method
Objective: 1
AACSB: Analytical skills

Answer the following questions using the information below:

The Laserlight Corporation operates one central plant that has two divisions, the Flashlight Division and the Night Light Division. The following data apply to the coming budget year:

Budgeted costs of operating the plant for 2,000 to 3,000 hours:
- Fixed operating costs per year: $450,000
- Variable operating costs: $600 per hour

Budgeted long-run usage per year:
- Flashlight Division: 2,000 hours
- Night Light Division: 500 hours
- Practical capacity: 3,000 hours

Assume that practical capacity is used to calculate the allocation rates.

Actual usage for the year by the Flashlight Division was 1,400 hours and by the Night Light Division was 600 hours.

18) If a single-rate cost-allocation method is used, what amount of operating costs will be budgeted for the Flashlight Division?
A) $1,500,000
B) $1,560,000
C) $1,140,000
D) $1,410,000
Answer: A
Explanation: A) \[ (2,000/3,000) \times 450,000 + (2,000 \times 600) = 1,500,000 \]
Diff: 2
Terms: single-rate cost-allocation method
Objective: 1
AACSB: Analytical skills
19) If a single-rate cost-allocation method is used, what amount of cost will be allocated to the Flashlight Division? Assume actual usage is used to allocate operating costs.
A) $1,140,000  
B) $1,200,000  
C) $1,500,000  
D) $1,050,000  
Answer: D  
Explanation:  D) \[(2,000/3,000) \times $450,000\] + (2,000 \times $600) = $1,500,000  
$1,500,000/2,000 \times 1,400 = $1,050,000  
Diff: 3  
Terms:  single-rate cost-allocation method  
Objective:  1  
AACSB:  Analytical skills

20) If a dual-rate cost-allocation method is used, what amount of operating costs will be budgeted for the Night Light Division?  
A) $390,000  
B) $450,000  
C) $375,000  
D) $435,000  
Answer: C  
Explanation:  C) \[(500/3,000) \times $450,000\] + (500 \times $600) = $375,000  
Diff: 2  
Terms:  dual-rate cost-allocation method  
Objective:  1  
AACSB:  Analytical skills

21) If a dual-rate cost-allocation method is used, what amount of cost will be allocated to the Night Light Division? Assume budgeted usage is used to allocate fixed operating costs and actual usage is used to allocate variable operating costs.  
A) $375,000  
B) $435,000  
C) $390,000  
D) $450,000  
Answer: B  
Explanation:  B) \[(500/3,000) \times $450,000\] + (600 \times $600) = $435,000  
Diff: 3  
Terms:  dual-rate cost-allocation method  
Objective:  1  
AACSB:  Analytical skills
22) The dual cost-allocation method classifies costs into two pools, a budgeted cost pool and an actual cost pool.
   Answer: FALSE
   Explanation: The dual cost-allocation method classifies costs into two pools, a variable cost pool and a fixed cost pool.
   Diff: 1
   Terms: dual-rate cost-allocation method
   Objective: 1
   AACSB: Reflective thinking

23) The dual-rate method makes no distinction between fixed and variable costs.
   Answer: FALSE
   Explanation: The dual-rate method makes a distinction between fixed and variable costs.
   Diff: 1
   Terms: dual-rate cost-allocation method
   Objective: 1
   AACSB: Reflective thinking

24) Using the single-rate method transforms the fixed costs per hour into a variable cost to users of that facility.
   Answer: TRUE
   Diff: 3
   Terms: single-rate cost-allocation method
   Objective: 1
   AACSB: Communication

25) The dual-rate cost-allocation method provides better information for decision making than the single-rate method.
   Answer: TRUE
   Explanation: The dual-rate cost-allocation method provides better information for decision making than the single-rate method.
   Diff: 2
   Terms: single-rate cost-allocation method, dual-rate cost-allocation method
   Objective: 1
   AACSB: Reflective thinking

26) An advantage of the single-rate method is that it is easier and always the most accurate cost-allocation choice.
   Answer: FALSE
   Explanation: The single-rate method is the easiest cost allocation method, but it is the least accurate cost-allocation choice.
   Diff: 2
   Terms: single-rate method
   Objective: 1
   AACSB: Reflective thinking
27) The fixed costs of operating the maintenance facility of General Hospital are $4,500,000 annually. Variable costs are incurred at the rate of $30 per maintenance-hour. The facility averages 40,000 maintenance-hours a year. Budgeted and actual hours per user for 20X3 are as follows:

<table>
<thead>
<tr>
<th>Department</th>
<th>Budgeted hours</th>
<th>Actual hours</th>
<th>Budgeted Amounts</th>
<th>Allocated Amounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Building and grounds</td>
<td>10,000</td>
<td>12,000</td>
<td>$1,425,000</td>
<td>$1,710,000</td>
</tr>
<tr>
<td>Operating and emergency</td>
<td>8,000</td>
<td>8,000</td>
<td>$1,140,000</td>
<td>$1,140,000</td>
</tr>
<tr>
<td>Patient care</td>
<td>21,000</td>
<td>22,000</td>
<td>$2,992,500</td>
<td>$3,135,000</td>
</tr>
<tr>
<td>Administration</td>
<td>1,000</td>
<td>1,200</td>
<td>$142,500</td>
<td>$171,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>40,000</strong></td>
<td><strong>43,200</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Assume that budgeted maintenance-hours are used to calculate the allocation rates.

**Required:**

a. If a single-rate cost-allocation method is used, what amount of maintenance cost will be budgeted for each department?

b. If a single-rate cost-allocation method is used, what amount of maintenance cost will be allocated to each department based on actual usage?

c. If a dual-rate cost-allocation method is used, what amount of maintenance cost will be budgeted for each department?

d. If a dual-rate cost-allocation method is used, what amount of maintenance cost will be allocated to each department based on actual usage? Based on budgeted usage for fixed operating costs and actual usage for variable operating costs?

**Answer:**

a. Total costs + $4,500,000 + ($30 × 40,000) = $5,700,000

Single rate = $5,700,000 / 40,000 mh = $142.50 per maintenance-hour

**Single-rate budgeted amounts:**

- Building and grounds: $142.50 × 10,000 = $1,425,000
- Operating and emergency: $142.50 × 8,000 = $1,140,000
- Patient care: $142.50 × 21,000 = $2,992,500
- Administration: $142.50 × 1,000 = $142,500

b. Total costs + $4,500,000 + ($30 × 40,000) = $5,700,000

Single rate = $5,700,000 / 40,000 mh = $142.50 per maintenance-hour

**Single-rate allocated amounts:**

- Building and grounds: $142.50 × 12,000 = $1,710,000
- Operating and emergency: $142.50 × 8,000 = $1,140,000
- Patient care: $142.50 × 22,000 = $3,135,000
- Administration: $142.50 × 1,200 = $171,000
c. **Dual-rate budgeted amounts:**

Building and grounds:
- Fixed ($4,500,000 × 10/40) $1,125,000
- Variable ($30 × 10,000) 300,000
- Total $1,425,000

Operating and emergency:
- Fixed ($4,500,000 × 8/40) $900,000
- Variable ($30 × 8,000) 240,000
- Total $1,140,000

Patient care:
- Fixed ($4,500,000 × 21/40) $2,362,500
- Variable ($30 × 21,000) 630,000
- Total $2,992,500

Administration:
- Fixed ($4,500,000 × 1/40) $112,500
- Variable ($30 × 1,000) 30,000
- Total $142,500

---

d. **Dual-rate allocated amounts:**

Building and grounds:
- Fixed ($4,500,000 × 10/40) $1,125,000
- Variable ($30 × 12,000) 360,000
- Total $1,485,000

Operating and emergency:
- Fixed ($4,500,000 × 8/40) $900,000
- Variable ($30 × 8,000) 240,000
- Total $1,140,000

Patient care:
- Fixed ($4,500,000 × 21/40) $2,362,500
- Variable ($30 × 22,000) 660,000
- Total $3,022,500

Administration:
- Fixed ($4,500,000 × 1/40) $112,500
- Variable ($30 × 1,200) 36,000
- Total $148,500

**Diff:** 2

**Terms:** single-rate cost-allocation method, dual-rate cost-allocation method

**Objective:** 1

**AACSB:** Analytical skills
28) The Alex Miller Corporation operates one central plant that has two divisions, the Flashlight Division and the Night Light Division. The following data apply to the coming budget year:

**Budgeted costs of the operating the plant**

*for 10,000 to 20,000 hours:*

- **Fixed operating costs per year:** $240,000
- **Variable operating costs:** $10 per hour

**Practical capacity:** 20,000 hours per year

**Budgeted long-run usage per year:**

- **Lamp Division:** 800 hours × 12 months = 9,600 hours per year
- **Flashlight Division:** 450 hours × 12 months = 5,400 hours per year

Assume that practical capacity is used to calculate the allocation rates. Further assume that actual usage of the Lamp Division was 700 hours and the Flashlight Division was 400 hours for the month of June.

**Required:**

a. If a single-rate cost-allocation method is used, what amount of operating costs will be budgeted for the Lamp Division each month? For the Flashlight Division each month?

b. For the month of June, if a single-rate cost-allocation method is used, what amount of cost will be allocated to the Lamp Division? To the Flashlight Division? Assume actual usage is used to allocate operating costs.

c. If a dual-rate cost-allocation method is used, what amount of operating costs will be budgeted for the Lamp Division each month? For the Flashlight Division each month?

d. For the month of June, if a dual-rate cost-allocation method is used, what amount of cost will be allocated to the Lamp Division? To the Flashlight Division? Assume budgeted usage is used to allocate fixed operating costs and actual usage is used to allocate variable operating costs.

**Answer:**

a. Fixed costs $240,000 / 20,000 practical capacity hours = $12 / hour

- Single-rate cost-allocation = $12 + $10 = $22 per hour
  - Lamp Division: 800 × $22 / hour = $17,600 per month
  - Flashlight Division: 450 × $22 / hour = $9,900 per month

b. Lamp Division: 700 × $22 / hour = $15,400 per month
   Flashlight Division: 400 × $22 / hour = $8,800 per month

c. Fixed costs $240,000 / 20,000 practical capacity hours = $12 / hour

- Budgeted costs Lamp Division: (800 × $12/hour) + (800 × $10/hour) = $17,600 per month
- Budgeted costs Flashlight Division: (450 × $12/hour) + (450 × $10/hour) = $9,900 per month

d. Allocated costs for June Lamp Division: (800 × $12 / hour) + (700 × $10/hour) = $16,600 per month
   Allocated costs for June Flashlight Division: (450 × $12 / hour) + (400 × $10/hour) = $9,400 per month
29) The Pitt Corporation has been outsourcing data processing in the belief that such outsourcing would reduce costs and increase corporate profitability. In spite of this, there has been no meaningful increase in corporate profitability.

Previously, Pitt used a single-rate method to allocate data processing costs. A per unit cost for data processing was computed and compared to the price of the outside supplier. The price of the outside supplier was lower, so the outside bid was accepted.

**Required:**
Formulate a possible reason why Pitt's profitability has not shown improvement in terms of the cost allocation method used.

Answer: The single-rate cost allocation method groups fixed and variable costs together within each cost pool. The deficiency of this comparison is that the fixed costs included in the cost pool will continue. Therefore, Pitt may be spending more funds in total than if the work was still performed in-house.

30) Van Meter Fig Company has substantial fluctuations in its production costs because of the seasonality of figs.

Would you recommend an actual or budgeted allocation base? Why? Would you recommend calculating monthly, seasonal, or annual allocation rates? Why?

Answer: The company should use a long-term budget amount for the allocation base. Neither an actual amount nor a budgeted monthly amount will provide the company with reliable allocation amounts because of the variability in the supply of figs. With long-term budgeted usage, the user departments will know their allocated costs in advance and should help them in their planning.
Objective 15.2

1) When budgeted cost-allocations rates are used:
A) variations in actual usage by one division affect the costs allocated to other divisions
B) the manager of the supplier division bears the risk of unfavorable cost variances
C) user divisions pay for costs that exceed budgeted amounts
D) user divisions pay for inefficiencies of the supplier department
Answer:  B
Diff: 3
Terms:  single-rate cost-allocation method, dual-rate cost-allocation method
Objective:  2
AACSB:  Reflective thinking

2) When actual cost-allocations rates are used:
A) user divisions pay for costs that exceed budgeted amounts
B) managers of the supplier division are motivated to improve efficiency
C) user divisions do not know allocated amounts until the end of the accounting period
D) managers of the user divisions may be tempted to underestimate planned usage
Answer:  C
Diff: 3
Terms:  single-rate cost-allocation method, dual-rate cost-allocation method
Objective:  2
AACSB:  Reflective thinking

3) Under the dual-rate cost-allocation method, when fixed costs are allocated based on actual usage then:
A) user-division managers are motivated to make accurate long-run usage forecasts
B) user-division managers can better plan for the short-run and for the long-run
C) the costs of unused capacity are highlighted
D) variations in one division's usage affect another division's allocation
Answer:  D
Diff: 3
Terms:  dual-rate cost-allocation method
Objective:  2
AACSB:  Reflective thinking

4) The costs of unused capacity are highlighted when:
A) actual usage based allocations are used
B) budgeted usage allocations are used
C) practical capacity-based allocations are used
D) the dual-rate cost-allocation method allocates fixed costs based on actual usage
Answer:  C
Diff: 2
Terms:  single-rate cost-allocation method, dual-rate cost-allocation method
Objective:  2
AACSB:  Reflective thinking
5) To discourage unnecessary use of a support department, management might:
A) not allocate any support department costs to user departments
B) allocate support department costs based upon user department usage
C) allocate a fixed amount of support department costs to each department regardless of use
D) issue memos on useful services provided by the support department
Answer: B
Diff: 3
Terms: single-rate cost-allocation method, dual-rate cost-allocation method
Objective: 2
AACSB: Analytical skills

6) The biggest advantage of using practical capacity to allocate costs is that it:
A) is a value that is readily available
B) never causes over or under-allocated overhead
C) burdens the user divisions with the costs of unused capacity
D) focuses management's attention on unused capacity
Answer: D
Diff: 3
Terms: single-rate cost-allocation method, dual-rate cost-allocation method, practical capacity
Objective: 2
AACSB: Reflective thinking

7) The practical capacity method of allocating costs is:
A) based on the budgeted capacity demanded.
B) based on actual capacity used.
C) based on the practical capacity supplied.
D) based on the using departments negotiating the charges they will accept.
Answer: C
Diff: 3
Terms: single-rate cost-allocation method, dual-rate cost-allocation method, practical capacity
Objective: 2
AACSB: Reflective thinking

8) When budgeted cost-allocation rates are used, user-division managers face uncertainty about the allocation rates for that budget period.
Answer: FALSE
Explanation: When budgeted cost-allocation rates are used, user-division managers face no uncertainty about the allocation rates for that budget period.
Diff: 2
Terms: single-rate cost-allocation method, dual-rate cost-allocation method
Objective: 2
AACSB: Reflective thinking
9) When actual cost-allocation rates are used, managers of the supplier division are motivated to improve efficiency.
Answer: FALSE
Explanation: When budgeted cost-allocation rates are used, managers of the supplier division are motivated to improve efficiency.
Diff: 2
Terms: single-rate cost-allocation method, dual-rate cost-allocation method
Objective: 2
AACSB: Reflective thinking

10) When budgeted cost-allocation rates are used, variations in actual usage by one division affect the costs allocated to other divisions.
Answer: FALSE
Explanation: When actual cost-allocations rates are used, variations in actual usage by one division affect the costs allocated to other divisions.
Diff: 2
Terms: single-rate cost-allocation method, dual-rate cost-allocation method
Objective: 2
AACSB: Communication

11) The only choices that a firm has for support department cost allocation rates are to use either a budgeted rate or an actual rate.
Answer: FALSE
Explanation: The choices a firm has for support department cost allocation rates include using a budgeted rate, an actual rate, or some negotiated rate.
Diff: 2
Terms: single-rate method, dual-rate method
Objective: 2
AACSB: Reflective thinking

12) The most common method to allocate support department costs is to employ actual rates based on the costs realized during the period.
Answer: FALSE
Explanation: This method is very uncommon due to the level of uncertainty it imposes on user divisions.
Diff: 2
Terms: single-rate method, dual-rate method
Objective: 2
AACSB: Reflective thinking
13) Blaster Drive-In is a fast-food restaurant that sells burgers and hot dogs in a 1950s environment. The fixed operating costs of the company are $5,000 per month. The controlling shareholder, interested in product profitability and pricing, wants all costs allocated to either the burgers or the hot dogs. The following information is provided for the operations of the company:

<table>
<thead>
<tr>
<th></th>
<th>Burgers</th>
<th>Hot Dogs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales for January</td>
<td>4,000</td>
<td>2,400</td>
</tr>
<tr>
<td>Sales for February</td>
<td>6,400</td>
<td>2,400</td>
</tr>
</tbody>
</table>

**Required:**

a. What amount of fixed operating costs is assigned to the burgers and hot dogs when actual sales are used as the allocation base for January? For February?

b. Hot dog sales for January and February remained constant. Did the amount of fixed operating costs allocated to hot dogs also remain constant for January and February? Explain why or why not. Comment on any other observations.

**Answer:**

a. *January sales:*
   - Burgers: $5,000 \times \frac{4,000}{(4,000 + 2,400)} = $3,125
   - Hot dogs: $5,000 \times \frac{2,400}{6,400} = $1,875

   *February sales:*
   - Burgers: $5,000 \times \frac{6,400}{(6,400 + 2,400)} = $3,636.36
   - Hot dogs: $5,000 \times \frac{2,400}{(6,400 + 2,400)} = $1,363.64

b. Even though hot dog sales remained constant for both months, the allocation of fixed operating costs decreased by more than $500. The reason is that fixed overhead costs are allocated based on actual sales. The dollar amount is fixed, and since burger sales increased, more of the fixed costs were allocated to the burgers.

   Another observation is that burger sales increased by more than 50% from January to February, while the fixed operating costs assigned to burgers increased by only 16%.

Diff: 2  
Terms: single-rate cost-allocation method, dual-rate cost-allocation method  
Objective: 2  
AACSB: Analytical skills
14) Marvelous Motors is a small motor supply outlet that sells motors to companies that make various small motorized appliances. The fixed operating costs of the company are $300,000 per year. The controlling shareholder, interested in product profitability and pricing, wants all costs allocated to the motors and wants to review the company status on a quarterly basis. The shareholder is trying to determine whether the costs should be allocated each quarter based on the 25% of the annual fixed operating costs ($75,000) or by using an annual forecast budget to allocate the costs. The following information is provided for the operations of the company:

<table>
<thead>
<tr>
<th>Forecast</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales for First Quarter 5,000</td>
<td>4,850</td>
</tr>
<tr>
<td>Sales for Second Quarter 8,000</td>
<td>7,900</td>
</tr>
<tr>
<td>Sales for Third Quarter 8,000</td>
<td>8,125</td>
</tr>
<tr>
<td>Sales for Fourth Quarter 3,000</td>
<td>3,125</td>
</tr>
</tbody>
</table>

**Required:**

a. What amount of fixed operating costs are assigned to each motor by quarter when actual sales are used as the allocation base and $75,000 is allocated?

b. How much fixed cost is recovered each quarter under requirement a.?

c. What amount of fixed operating costs are assigned to each motor by quarter when forecast sales are used as the allocation base and the rate is calculated annually as part of the budgetary process?

d. How much fixed cost is recovered each quarter under requirement c.?

e. Which method seems more appropriate in this case? Explain.

**Answer:**

a. *Rate per unit using Actual Sales by Quarter:*

   - Q1: \( \frac{75,000}{4,850} = 15.46 \) per motor
   - Q2: \( \frac{75,000}{7,900} = 9.49 \) per motor
   - Q3: \( \frac{75,000}{4,850} = 9.23 \) per motor
   - Q4: \( \frac{75,000}{4,850} = 24.00 \) per motor

b. $75,000 cost is recovered each quarter => $300,000 cost recovered over the year.

c. *Quarterly Cost Recovery using Annual Forecast of Sales:*

   Forecast Sales for the year = 5,000 + 8,000 + 8,000 + 3,000 = 24,000
   Rate per motor = \( \frac{300,000}{24,000} = 12.50 \) per motor

d. *Quarterly Cost Recovery using Annual Forecast of Sales as the allocation basis:*

   - Q1: \( 4,850 \times 12.50 = 60,625 \)
   - Q2: \( 7,900 \times 12.50 = 98,750 \)
   - Q3: \( 8,125 \times 12.50 = 101,563 \)
   - Q4: \( 3,125 \times 12.50 = 39,062 \) => $300,000 cost recovered over the year

e. The budgeted rate based on an annualized forecast of sales is more appropriate to use.

   The fluctuations in sales was predictable and using actual quantities per quarter to calculate the cost recovery rates would distort the objective of assigning appropriate costs to the units. There would be uncertainty in interpretation of why one quarter has a very high rate per unit and another quarter has a very low rate per unit if the actual quarters fixed costs were spread to the actual units sold each quarter.
15) Jonathan has managed a downtown store in a major metropolitan city for several years. The firm has ten stores in varying locations. In the past, senior management noticed Jonathan's work and he has received very good annual evaluations for his management of the store.

This year his store has generated steady growth in sales, but earnings have been deteriorating. After examining the monthly performance report generated by the company budgeting department, he noticed that increasing fixed costs is causing the decrease in earnings.

Administrative corporate costs, primarily fixed costs, are allocated to individual stores each month based on actual sales for that month. Two of these stores are currently growing at a rapid pace, while four other stores are having operating difficulties.

**Required:**
From the information presented, what do you think is the cause of Jonathan's reported decrease in earnings? How can this be corrected?

**Answer:** The variations in reporting are probably caused by the growth fluctuations of the other branches. When fixed costs are involved in an allocation process based on actual usage, one unit receiving the allocation can have changes even when it doesn't change itself. This is caused by the other stores causing changes in the allocation base, thereby causing everyone to receive different allocation amounts, even those who don't have changes in their base. Because Jonathan's sales have been increasing, his allocation of corporate fixed costs has also increased.

To correct the problem, the corporation should change to using budgeted performance as the allocation base and use a denominator level that reflects expected performance over the long run. An allocation base other than sales may also want to be considered.
16) Why do organizations use budgeted rates instead of actual rates to allocate the costs of support departments to each other and to user departments and divisions? Explain.
Answer: The method of using actual rates based on costs realized during the period imposes a level of uncertainty on the user departments.

When allocations are made using budgeted rates, managers of departments to which costs are allocated know with certainty the rates to be used in that budgetary period. Users can determine the amount of service to request. Budgeted rates also help motivate the manager of the support department to improve efficiency. The supplier department bears the risk of unfavorable variances and is aware of factors which may be causing negative variances. In cases where the support department's costs are out of control of the support department manager, the uncontrollable factors can be identified and the supplier department can either be relieved of responsibility for those specific factors or there can be a risk sharing agreement negotiated between the support department and the user departments.

Diff: 2
Terms: actual rates, budgeted rates
Objective: 2
AACSB: Reflective thinking

Objective 15.3

1) Special cost-allocation problems arise when:
A) support department costs exceed budgetary estimates
B) practical capacity is used as the allocation base
C) support departments provide reciprocal services to other support departments
D) there is more than one operating department
Answer: C
Diff: 2
Terms: support department
Objective: 3
AACSB: Communication

2) Which of the following departments is NOT a support department for a boat manufacturing company?
A) Personnel
B) Molding and assembly
C) Data processing
D) Accounting
Answer: B
Diff: 1
Terms: support department
Objective: 3
AACSB: Analytical skills
3) The support department allocation method that is the most widely used because of its simplicity is the:
A) step-down method
B) reciprocal allocation method
C) direct allocation method
D) sequential allocation method
Answer: C
Diff: 1
Terms: direct allocation method
Objective: 3
AACSB: Reflective thinking

4) The method that allocates costs by explicitly including all the services rendered among all support departments is the:
A) direct method
B) step-down method
C) reciprocal method
D) sequential method
Answer: C
Diff: 2
Terms: reciprocal method
Objective: 3
AACSB: Reflective thinking

5) Under which allocation method are one-way reciprocal support services recognized?
A) direct method
B) artificial cost method
C) reciprocal method
D) step-down method
Answer: D
Diff: 2
Terms: step-down allocation method
Objective: 3
AACSB: Reflective thinking

6) The direct allocation method:
A) partially recognizes the services provided among support departments
B) is also referred to as the sequential method
C) is conceptually the most precise method
D) results in allocating only the support costs used by operating departments
Answer: D
Diff: 3
Terms: direct allocation method
Objective: 3
AACSB: Reflective thinking
7) The step-down allocation method:
A) typically begins with the support department that provides the highest percentage of its total services to other support departments
B) recognizes the total amount of services that support departments provide to each other
C) allocates complete reciprocated costs
D) offers key input for outsourcing decisions
Answer: A
Diff: 3
Terms: step-down allocation method
Objective: 3
AACSB: Reflective thinking

8) The reciprocal allocation method:
A) is the most widely used because of its simplicity
B) requires the ranking of support departments in the order that the allocation is to proceed
C) is conceptually the most precise
D) results in allocating more support costs to operating departments than actually incurred
Answer: C
Diff: 3
Terms: reciprocal allocation method
Objective: 3
AACSB: Reflective thinking

9) Complete reciprocated costs:
A) are less than the support department's own costs
B) include the support department's costs plus any interdepartmental cost allocations
C) are used for step-down allocations
D) are also referred to as budgeted costs
Answer: B
Diff: 2
Terms: complete reciprocated costs
Objective: 3
AACSB: Reflective thinking
Answer the following questions using the information below:

Jake's Battery Company has two service departments, Maintenance and Personnel. Maintenance Department costs of $320,000 are allocated on the basis of budgeted maintenance-hours. Personnel Department costs of $80,000 are allocated based on the number of employees. The costs of operating departments A and B are $160,000 and $240,000, respectively. Data on budgeted maintenance-hours and number of employees are as follows:

<table>
<thead>
<tr>
<th>Support Departments</th>
<th>Production Departments</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maintenance Department</td>
</tr>
<tr>
<td>Budgeted costs</td>
<td>$320,000</td>
</tr>
<tr>
<td>Budgeted maintenance-hours</td>
<td>NA</td>
</tr>
<tr>
<td>Number of employees</td>
<td>40</td>
</tr>
</tbody>
</table>

10) Using the direct method, what amount of Maintenance Department costs will be allocated to Department B?
A) $96,000
B) $128,000
C) $156,000
D) $192,000
Answer: B
Explanation: B) 640/ (640 + 960) × $320,000 = $128,000
Diff: 2
Terms: direct allocation method
Objective: 3
AACSB: Analytical skills

11) Using the direct method, what amount of Personnel Department costs will be allocated to Department B?
A) $20,000
B) $32,000
C) $48,000
D) $60,000
Answer: D
Explanation: D) 480/640 × $80,000= $60,000
Diff: 2
Terms: direct allocation method
Objective: 3
AACSB: Analytical skills
12) Using the step-down method, what amount of Maintenance Department cost will be allocated to Department B if the service department with the highest percentage of interdepartmental support service is allocated first? (Round up)

A) $64,000
B) $85,333
C) $114,667
D) $128,000

Answer: B

Explanation: B) Maintenance provided to Personnel: 800 / (800 + 960 + 640) = .333
Personnel provided to Maintenance: 40 / (40 + 160 + 480) = .059
Maintenance provides the greatest amount of service to support departments, so it is allocated first. Dept B: 640/2,400 × $320,000 = $85,333

Diff: 3
Terms: step-down allocation method
Objective: 3
AACSB: Analytical skills

13) Using the direct method, what amount of Maintenance Department costs will be allocated to Department A?

A) $96,000
B) $128,000
C) $166,000
D) $192,000

Answer: D

Explanation: D) 960 / (640 + 96) × $320,000 = $192,000

Diff: 2
Terms: direct allocation method
Objective: 3
AACSB: Analytical skills

14) Using the direct method, what amount of Personnel Department costs will be allocated to Department A?

A) $20,000
B) $32,000
C) $48,000
D) $60,000

Answer: A

Explanation: A) 160 / (160 + 480) × $80,000 = $20,000

Diff: 2
Terms: direct allocation method
Objective: 3
AACSB: Analytical skills
15) Using the step-down method, what amount of Maintenance Department cost will be allocated to Department A if the service department with the highest percentage of interdepartmental support service is allocated first? (Round up)
A) $64,000
B) $85,333
C) $114,667
D) $128,000
Answer:  D
Explanation:  D) Maintenance provided to Personnel: 800 / (800 + 960 + 640) = .333
Personnel provided to Maintenance: 40 / (40 + 160 + 480) = .059
Maintenance provides the greatest amount of service to support departments, so it is allocated first.
Dept A: 960 / (800 + 960 + 640) × $320,000 = $128,000
Diff: 3
Terms:  step-down allocation method
Objective:  3
AACSB:  Analytical skills
Answer the following questions using the information below:

Goldfarb's Book and Music Store has two service departments, Warehouse and Data Center. Warehouse Department costs of $350,000 are allocated on the basis of budgeted warehouse-hours. Data Center Department costs of $150,000 are allocated based on the number of computer log-on hours. The costs of operating departments Music and Books are $250,000 and $300,000, respectively. Data on budgeted warehouse-hours and number of computer log-on hours are as follows:

<table>
<thead>
<tr>
<th>Support Departments</th>
<th>Production Departments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warehouse Department</td>
<td>Data Center Department</td>
</tr>
<tr>
<td>Budgeted costs</td>
<td>Budgeted costs</td>
</tr>
<tr>
<td>$350,000</td>
<td>$150,000</td>
</tr>
<tr>
<td>Budgeted warehouse-hours</td>
<td>1,000</td>
</tr>
<tr>
<td>Number of computer hours</td>
<td>800</td>
</tr>
</tbody>
</table>

16) Using the direct method, what amount of Warehouse Department costs will be allocated to Department Books?
A) $140,000
B) $210,000
C) $150,000
D) $175,000

Answer: B
Explanation: B) 1,500 / (1,000 + 1,500) × $350,000 = $210,000
Diff: 2
Terms: direct allocation method
Objective: 3
AACSB: Analytical skills

17) Using the direct method, what amount of Data Center Department costs will be allocated to Department Music?
A) $150,000
B) $66,667
C) $83,333
D) $60,000

Answer: B
Explanation: B) 800 / (800 + 1,000) × $150,000 = $66,667
Diff: 2
Terms: direct allocation method
Objective: 3
AACSB: Analytical skills
18) Using the step-down method, what amount of Data Center Department cost will be allocated to the Warehouse Department if the service department with the highest percentage of interdepartmental support service is allocated first? (Round up)
A) $50,000
B) $150,000
C) $15,000
D) $0
Answer: D
Explanation:
D) Warehouse provided to Data Center: \( \frac{500}{500 + 1000 + 1500} = .167 \)
Data Center provided to Warehouse: \( \frac{200}{200 + 800 + 1000} = .100 \)
Warehouse provides the greatest amount of service to support departments, so it is allocated first. Therefore, there will be no cost from the Data Center allocated to the Warehouse department.
Diff: 3
Terms: step-down allocation method
Objective: 3
AACSB: Analytical skills

19) Using the step-down method, what amount of Warehouse Department cost will be allocated to Department Music if the service department with the highest percentage of interdepartmental support service is allocated first? (Round up)
A) $233,333
B) $116,667
C) $243,333
D) $121,667
Answer: B
Diff: 3
Terms: step-down allocation method
Objective: 3
AACSB: Analytical skills

20) Using the step-down method, what amount of Data Center Department cost will be allocated to Department Music if the service department with the highest percentage of interdepartmental support service is allocated first? (Round up)
A) $117,342
B) $66,667
C) $92,592
D) $83,333
Answer: C
Explanation:
C) Warehouse provided to Data Center: \( \frac{500}{500 + 1000 + 1500} = .167 \)
Data Center provided to Warehouse: \( \frac{200}{200 + 800 + 1000} = .100 \)
Warehouse provides the greatest amount of service to support departments, so it is allocated first. Data Center gets costs from Warehouse = \( .167 \times (\$350,000) = \$58,333 \)
Data Center total costs are now = \$150,000 + \$58,333 = \$208,333
Allocation of Data Center to Music = \( (800/(800+1,000)) \times \$208,333 = \$92,592 \)
Diff: 3
Terms: step-down allocation method
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

Alfred, owner of Hi-Tech Fiberglass Fabricators, Inc., is interested in using the reciprocal allocation method. The following data from operations were collected for analysis:

**Budgeted manufacturing overhead costs:**

<table>
<thead>
<tr>
<th>Department</th>
<th>Service Department</th>
<th>Budgeted Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant Maintenance</td>
<td>PM (Support Dept)</td>
<td>$350,000</td>
</tr>
<tr>
<td>Data Processing</td>
<td>DP (Support Dept)</td>
<td>$75,000</td>
</tr>
<tr>
<td>Machining</td>
<td>M (Operating Dept)</td>
<td>$225,000</td>
</tr>
<tr>
<td>Capping</td>
<td>C (Operating Dept)</td>
<td>$125,000</td>
</tr>
</tbody>
</table>

**Services furnished:**

By Plant Maintenance (budgeted labor-hours):
- to Data Processing 3,500
- to Machining 5,000
- to Capping 8,200

By Data Processing (budgeted computer time):
- to Plant Maintenance 600
- to Machining 3,500
- to Capping 600

21) Which of the following linear equations represents the complete reciprocated cost of the Data Processing Department?

A) \( DP = 75,000 + \frac{600}{4,700} \) PM
B) \( DP = 75,000 + \frac{3,500}{16,700} \) PM
C) \( DP = 75,000 \times \frac{600}{4,700} + 350,000 \times \frac{3,340}{16,700} \)
D) \( DP = 350,000 + \frac{600}{16,700} \) DP

Answer: B

Explanation: B) \( DP = 75,000 + \frac{3,500}{16,700} \) PM

PM= \( 350,000 + \left( \frac{3,500}{16,700} \right) DP \)

PM= \( 350,000 + \left( \frac{600}{4,700} \right) \times \left( \frac{75,000}{3,340} \right) \) PM

PM= \( 350,000 + 9,574 + (0.026755)PM \)

0.973245 PM = 359,574

PM= 369,459

Diff: 3

Terms: service department, complete reciprocated costs
Objective: 3
AACSB: Analytical skills

22) What is the complete reciprocated cost of the Plant Maintenance Department?

A) \( 393,750 \)
B) \( 369,459 \)
C) \( 365,000 \)
D) \( 375,773 \)

Answer: B

Explanation: B) \( DP = 75,000 + \frac{3,500}{16,700} \) PM

PM= \( 350,000 + \left( \frac{600}{4,700} \right) DP \)

PM= \( 350,000 + \left( \frac{600}{4,700} \right) \times \left( \frac{75,000}{3,340} \right) \) PM

PM= \( 350,000 + 9,574 + (0.026755)PM \)

0.973245 PM = 359,574

PM= 369,459

Diff: 3

Terms: complete reciprocated costs
Objective: 3
AACSB: Analytical skills
23) What is the complete reciprocated cost of the Data Processing Department?
A) $90,000
B) $118,750
C) $122,971
D) $152,432
Answer: D
Explanation: D) DP = $75,000 + (3,500/16,700) PM
PM= $350,000 + (600/4,700) DP
PM= $350,000 + (600/4,700) × [$$75,000 + (3,500/16,700) PM]$$
PM= $350,000 + $9,574 + (0.026755)PM
0.973245 PM = $359,574
PM= $369,459
PM= $369,459; DP = $75,000 + (3,500/16,700) PM
DP= $75,000 + (3,500/16,700) $369,459 = $152,432
Diff: 3
Terms: complete reciprocated costs
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

Hugo, owner of Automated Fabric, Inc., is interested in using the reciprocal allocation method. The following data from operations were collected for analysis:

**Budgeted manufacturing overhead costs:**
- **Maintenance M (Support Dept)**: $300,000
- **Personnel P (Support Dept)**: $160,000
- **Weaving W (Weaving Dept)**: $650,000
- **Colorizing C (Colorizing Dept)**: $350,000

**Services furnished:**
- By Maintenance (budgeted labor-hours):
  - to Personnel: 1,000
  - to Weaving: 7,000
  - to Colorizing: 4,000
- By Personnel (Number of employees serviced):
  - Plant Maintenance: 10
  - Weaving: 30
  - Colorizing: 20

24) Which of the following linear equations represents the complete reciprocated cost of the Personnel Department?
   A) \( P = $300,000 - $160,000 \times \frac{1,000}{12,000} \times M \)
   B) \( P = \frac{1,000}{12,000} \times M \)
   C) \( P = $160,000 + \frac{1,000}{12,000} \times M \)
   D) \( P = $160,000 \)
   Answer: C
   Diff: 3
   Terms: service department, complete reciprocated costs
   Objective: 3
   AACSB: Analytical skills

25) What is the complete reciprocated cost of the Maintenance Department?
   A) $331,267
   B) $326,667
   C) $300,000
   D) $0
   Answer: A
   Explanation: A) \( P = $160,000 + \frac{1,000}{12,000} \times M \)
   \( M = $300,000 + \frac{10}{60} \times P \)
   \( M = $300,000 + \frac{10}{60} \times \left[ $160,000 + \frac{1,000}{12,000} \times M \right] \)
   \( M = $300,000 + $26,667 + \left( 0.013889 \times M \right) \)
   \( 0.986111 \times M = $326,667 \)
   \( M = $331,267 \)
   Diff: 3
   Terms: complete reciprocated costs
   Objective: 3
   AACSB: Analytical skills
26) What is the complete reciprocated cost of the Personnel Department?
A) $185,000
B) $187,606
C) $160,000
D) $210,000
Answer: B
Explanation: B) P = $160,000 + (1,000/12,000) M
M = $300,000 + (10/60) P
M = $300,000 + (10/60) × [$160,000 + (1,000/12,000) M]
M = $300,000 + $26,667 + (.013889) M
0.986111 M = $326,667
M = $331,267
P = $160,000 + (1,000/12,000) M
P = $160,000 + (1,000/12,000) ($331,267)
P = $187,606
Diff: 3
Terms: complete reciprocated costs
Objective: 3
AACSB: Analytical skills

27) Which of the following departments is NOT an operating (or value added) department?
A) Machining
B) Accounting
C) Assembly
D) Finishing
Answer: B
Diff: 2
Terms: operating department
Objective: 3
AACSB: Reflective thinking

28) Which of the following is NOT one of the three methods of allocating support department costs to operating departments?
A) direct method
B) incremental method
C) step-down method
D) reciprocal method
Answer: B
Diff: 3
Terms: operating dept, support dept; direct, step-down, and reciprocal method
Objective: 3
AACSB: Reflective thinking
29) The cost-allocation method that allocates support department costs only to production departments is the:
A) direct method  
B) sequential method  
C) step-down method  
D) reciprocal method  
Answer: A  
Diff: 2  
Terms: operating dept, support dept; direct, step-down, and reciprocal method  
Objective: 3  
AACSB: Reflective thinking

30) The direct allocation method allows for no recognition of services rendered by support departments to other support departments.  
Answer: TRUE  
Explanation: The direct allocation method allows for no recognition of services rendered by support departments to other support departments.  
Diff: 2  
Terms: direct allocation method  
Objective: 3  
AACSB: Communication

31) The direct method allocates each support department's costs to operating departments only.  
Answer: TRUE  
Diff: 2  
Terms: direct method  
Objective: 3  
AACSB: Reflective thinking

32) The direct allocation method incorporates mutual services provided among all support departments.  
Answer: FALSE  
Explanation: The reciprocal allocation method incorporates mutual services provided among all support departments.  
Diff: 2  
Terms: reciprocal allocation method  
Objective: 3  
AACSB: Communication

33) Budgeted amounts for a support department will always exceed complete reciprocated costs for that department.  
Answer: FALSE  
Explanation: Complete reciprocated costs equal budgeted amounts for the support department plus any interdepartmental cost allocations, therefore, complete reciprocated costs always exceed budgeted amounts.  
Diff: 3  
Terms: complete reciprocated costs, support department  
Objective: 3  
AACSB: Analytical skills
34) The direct allocation method provides key information for outsourcing decisions regarding support services.
Answer: FALSE
Explanation: Complete reciprocal costs of a support department provide key information for outsourcing decisions regarding support services. The direct allocation method does not provide this information.
Diff: 3
Terms: support department, direct allocation method
Objective: 3
AACSB: Communication

35) The incremental method of allocating common costs often creates the incentive to be the first-ranked user.
Answer: FALSE
Explanation: The incremental method creates a disincentive to be the first-ranked user because the first-ranked user receives the greatest allocation of cost.
Diff: 3
Terms: incremental cost-allocation method
Objective: 3
AACSB: Analytical skills

36) The direct method allocates each support department's costs to operating departments but NOT to other support departments.
Answer: TRUE
Explanation: The direct method allocates each support department's costs to operating departments but not to other support departments.
Diff: 2
Terms: direct method
Objective: 3
AACSB: Communication

37) The step-down method allocates support department costs to other support departments and to operating departments in a sequential manner.
Answer: TRUE
Diff: 2
Terms: step-down method
Objective: 3
AACSB: Communication

38) The reciprocal method of support department cost allocation is the most precise method and therefore is used most often.
Answer: FALSE
Explanation: The reciprocal method of support department cost allocation is the most precise method but is not often used due to its relative complexity.
Diff: 2
Terms: reciprocal method
Objective: 3
AACSB: Reflective thinking
39) Gotham University offers only high-tech graduate-level programs. Gotham has two principal operating departments, Engineering and Computer Sciences, and two support departments, Facility and Technology Maintenance and Enrollment Services. The base used to allocate facility and technology maintenance is budgeted total maintenance hours. The base used to allocate enrollment services is number of credit hours for a department. The Facility and Technology Maintenance budget is $350,000, while the Enrollment Services budget is $950,000. The following chart summarizes budgeted amounts and allocation-base amounts used by each department:

<table>
<thead>
<tr>
<th>Services Provided: (Annually)</th>
<th>Budget</th>
<th>Engineering (in hours)</th>
<th>Computer Sciences (in credit hrs)</th>
<th>F&amp;T Maintenance</th>
<th>Enrollment Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facility and Technology Maintenance (in hours)</td>
<td>$350,000</td>
<td>2,000</td>
<td>5,000</td>
<td>Zero</td>
<td>1,000</td>
</tr>
<tr>
<td>Enrollment Service (in credit hrs)</td>
<td>$950,000</td>
<td>24,000</td>
<td>36,000</td>
<td>2,000</td>
<td>Zero</td>
</tr>
</tbody>
</table>

**Required:**

Use the direct method to allocate support costs to each of the two principal operating departments, Engineering and Computer Sciences. Prepare a schedule showing the support costs allocated to each department.

**Answer:**

<table>
<thead>
<tr>
<th></th>
<th>Engineering</th>
<th>Computer Science</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>F&amp;T Maintenance</strong></td>
<td>$350,000 × 2/7 = $100,000</td>
<td>$250,000</td>
</tr>
<tr>
<td><strong>Enrollment Service</strong></td>
<td>$950,000 × 5/7 = $380,000</td>
<td>$570,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$480,000</td>
<td>$820,000</td>
</tr>
</tbody>
</table>

**Diff:** 2

**Terms:** direct allocation method

**Objective:** 3

**AACSB:** Analytical skills
Gotham University offers only high-tech graduate-level programs. Gotham has two principal operating departments, Engineering and Computer Sciences, and two support departments, Facility and Technology Maintenance and Enrollment Services. The base used to allocate facility and technology maintenance is budgeted total maintenance hours. The base used to allocate enrollment services is number of credit hours for a department. The Facility and Technology Maintenance budget is $350,000, while the Enrollment Services budget is $950,000. The following chart summarizes budgeted amounts and allocation-base amounts used by each department:

<table>
<thead>
<tr>
<th>Services Provided: (Annually)</th>
<th>Budget</th>
<th>Engineering</th>
<th>Computer Sciences</th>
<th>F&amp;T Maintenance</th>
<th>Enrollment Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>F&amp;T Maintenance (in hours)</td>
<td>$350,000</td>
<td>1,000</td>
<td>2,000</td>
<td>Zero</td>
<td>5,000</td>
</tr>
<tr>
<td>Enrollment Service (in credit hrs)</td>
<td>$950,000</td>
<td>24,000</td>
<td>36,000</td>
<td>2,000</td>
<td>Zero</td>
</tr>
</tbody>
</table>

Required:
Prepare a schedule which allocates service department costs using the step-down method with the sequence of allocation based on the highest-percentage support concept. Compute the total amount of support costs allocated to each of the two principal operating departments, Engineering and Computer Sciences.

Answer: F&T Maintenance provided to enrollment services = 5,000/8,000
Enrollment services provided to maintenance = 2,000/62,000
F&T Maintenance provides the greatest amount of service to support departments, so it is allocated first.

F&T Maintenance $350,000 to Enrollment Services = $350,000 × 5/8 = $218,750
to Engineering = $350,000 × 1/8 = $43,750
to Computer Science = $350,000 × 2/8 = $87,500

Enrollment Service costs of $950,000 + $218,750 = $1,168,750
are allocated to Engineering and Computer Science
to Engineering = $1,168,750 × 24/60 = $467,500
to Computer Science = $1,168,750 × 36/60 = $701,250

<table>
<thead>
<tr>
<th>F&amp;T Maintenance</th>
<th>Enrollment Service</th>
<th>Engineering</th>
<th>Computer Science</th>
</tr>
</thead>
<tbody>
<tr>
<td>$350,000 (350,000)</td>
<td>$950,000</td>
<td>$43,750</td>
<td>$87,500</td>
</tr>
<tr>
<td>$0 (1,168,750)</td>
<td>$218,750</td>
<td>$467,500</td>
<td>$701,250</td>
</tr>
<tr>
<td>Totals</td>
<td>$0</td>
<td>$511,250</td>
<td>$788,750</td>
</tr>
</tbody>
</table>

Diff: 3
Terms: step-down allocation method
Objective: 3
AACSB: Analytical skills
41) Gotham University offers only high-tech graduate-level programs. Gotham has two principal operating departments, Engineering and Computer Sciences, and two support departments, Facility and Technology Maintenance and Enrollment Services. The base used to allocate facility and technology maintenance is budgeted total maintenance hours. The base used to allocate enrollment services is number of credit hours for a department. The Facility and Technology Maintenance budget is $350,000, while the Enrollment Services budget is $950,000. The following chart summarizes budgeted amounts and allocation-base amounts used by each department:

<table>
<thead>
<tr>
<th>Services Provided: (Annually)</th>
<th>Budget</th>
<th>Engineering</th>
<th>Computer Sciences</th>
<th>F&amp;T Maintenance</th>
<th>Enrollment Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering</td>
<td>$3,500,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer Sciences</td>
<td>$1,400,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F&amp;T Maintenance (in hours)</td>
<td>$350,000</td>
<td>2,000</td>
<td>1,000</td>
<td>Zero</td>
<td>5,000</td>
</tr>
<tr>
<td>Enrollment Service (in credit hrs)</td>
<td>$950,000</td>
<td>24,000</td>
<td>36,000</td>
<td>2,000</td>
<td>Zero</td>
</tr>
</tbody>
</table>

**Required:**

a. Set up algebraic equations in linear equation form for each activity.
b. Determine total costs for each department by solving the equations from part (a) using the reciprocal method.

(Engineering = Eng; Computer Sciences = CS; Facility and Technical Maintenance = FTM; Enrollment Service = ES)

**Answer:**

a. Eng = $1,400,000 + 2/8 (FTM) + 24/62 (ES)
   CS = $3,500,000 + 1/8 (FTM) + 36/62 (ES)
   FTM = $350,000 + 2/62 (ES)
   ES = $950,000 + 5/8 (FTM)

b. Enrollment Service = $950,000 + 0.625 (FTM)
   ES = $950,000 + 0.625 (350,000 + 2/62 ES)
   ES = $950,000 + $218,750 + 0.02 ES
   0.98 ES = $1,168,750
   ES = $1,192,602

   $FTM = $350,000 + 2/62 ($1,192,602) = $388,471

   Engineering = $1,400,000 + 2/8 ($388,471) + 24/62 ($1,192,602)
   $1,400,000 + 97,118 + 461,652 = $1,958,770

   CS = $3,500,000 + 1/8 ($388,471) + 36/62 ($1,192,602)
   = $3,500,000 + $48,559 + $692,479
   = $4,241,038
42) Campaign Printing has two service departments, S1 and S2, and two production departments, P1 and P2.

The data for May were as follows:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Costs</th>
<th>Services provided to:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>S1</td>
</tr>
<tr>
<td>S1</td>
<td>$90,000</td>
<td>10%</td>
</tr>
<tr>
<td>S2</td>
<td>$60,000</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Fixed Costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P1</td>
<td>$360,000</td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>$520,000</td>
<td></td>
</tr>
</tbody>
</table>

**Required:**

a. Set up algebraic equations in linear form for each activity.

b. Determine total costs for each department by solving the equations from part (a) using the reciprocal method.

**Answer:**

a. \( S1 = $90,000 + 0.20 \times S2 \)

\( S2 = $60,000 + 0.10 \times S1 \)

\( P1 = $360,000 + 0.40 \times S1 + 0.55 \times S2 \)

\( P2 = $520,000 + 0.50 \times S1 + 0.25 \times S2 \)

b. \( S1 = $90,000 + 0.20 \times ($60,000 + 0.10 \times S1) \)

\( S1 = $90,000 + $12,000 + 0.02 \times S1 \)

\( 0.98 \times S1 = $102,000 \)

\( S1 = $104,082 \)

\( S2 = $60,000 + (0.10 \times $104,082) = $70,408 \)

\( P1 = $360,000 + (0.40 \times $104,082) + (0.55 \times $70,408) = $440,357 \)

\( P2 = $520,000 +(0.50 \times $104,082) + (0.25 \times $70,408) = $589,643 \)
43) Describe methods which may be used to allocate support costs within organizations containing multiple support departments. Discuss advantages and disadvantages of the various methods.

Answer: Three methods which are used to allocate costs of support departments are; the direct method, the step-down method, and the reciprocal method.

The direct method allocates support department costs only to the operating departments. An advantage of this approach is simplicity. A disadvantage of the approach is that it does not take into account the extent to which some support departments use the services of other support departments. The resultant permutation of costs will not be distributed to the operating departments accurately because they will not have recognized the mutual services provided among all support departments.

The step-down method allocates support department costs to other support departments in a sequential manner that partially recognizes the mutual services provided among all support departments. The method usually ranks the support departments in order of the highest percentage of its total services to other support departments. This provides more accuracy than the direct method with a minimum added level of complexity in the process.

The reciprocal method allocates support department costs to operating departments by fully recognizing the mutual services provided among all support departments. The method is complicated in that it either requires an iterative series of allocations or a linear programming solution to determine the final amounts to be allocated between the support departments which use each others services. It provides the highest level of accuracy but is complex to implement.

Diff: 2
Terms: direct method, step-down method, reciprocal method
Objective: 3
AACSB: Reflective thinking

Objective 15.4

1) A cost of operating a facility, department, activity area, or like cost object that is shared by two or more users is called a:
A) direct cost
B) joint cost
C) fixed cost
D) common cost
Answer: D
Diff: 1
Terms: common cost
Objective: 4
AACSB: Reflective thinking
2) Under the stand-alone method of allocating common costs:
A) a ranking is used to allocate costs among the users
B) disputes can arise over who is the primary user
C) each party bears a proportionate share of the total costs in relation to their individual stand-alone costs
D) an incentive is created to be the first-ranked user
Answer: C
Diff: 3
Terms: stand-alone cost-allocation method
Objective: 4
AACSB: Reflective thinking

3) Under the incremental method of allocating common costs:
A) the parties are interested in being viewed as primary users
B) each party bears a proportionate share of the total costs in relation to their individual stand-alone costs
C) fairness and equity are emphasized
D) there is a disincentive to be titled the primary user
Answer: D
Diff: 3
Terms: incremental cost-allocation method
Objective: 4
AACSB: Reflective thinking

Answer the following questions using the information below:

The Salmon Bay Corporation currently uses a manufacturing facility costing $200,000 per year; 80% of the facility's capacity is currently being used. A start-up business has proposed a plan that would utilize the other 20% of the facility and increase the overall costs of maintaining the space by 5%.

4) If the stand-alone method were used, what amount of cost would be allocated to the start-up business?
A) $40,000
B) $50,000
C) $40,000
D) $42,000
Answer: D
Explanation: D) $200,000 × 1.05 = $210,000; $210,000 × .2 = $42,000
Diff: 2
Terms: stand-alone cost-allocation method
Objective: 4
AACSB: Analytical skills
5) If the incremental method were used, what amount of cost would be allocated to the start-up business?
A) $40,000
B) $50,000
C) $40,000
D) $42,000
Answer: A
Explanation: A) $200,000 \times 0.20 = $40,000
Diff: 2
Terms: incremental cost-allocation method
Objective: 4
AACSB: Analytical skills

Answer the following questions using the information below:

The Cold Spring Harbor Corporation currently leases a corporate suite in an office building for a cost of $180,000 a year. Only 70% of the corporate suite is currently being used. A start-up business has proposed a plan that would use the other 30% of the suite and increase the overall costs of maintaining the space by $20,000.

6) If the stand-alone method were used, what amount of cost would be allocated to the start-up business?
A) $20,000
B) $54,000
C) $60,000
D) $74,000
Answer: C
Explanation: C) $200,000 \times 0.30 = $60,000
Diff: 2
Terms: stand-alone cost-allocation method
Objective: 4
AACSB: Analytical skills

7) If the incremental method were used, what amount of cost would be allocated to the start-up business?
A) $20,000
B) $54,000
C) $60,000
D) $74,000
Answer: A
Explanation: A) $20,000, the increased cost of maintaining the space
Diff: 2
Terms: incremental cost-allocation method
Objective: 4
AACSB: Analytical skills
8) The stand-alone method of allocating common costs emphasizes fairness and equity among users.
   Answer: TRUE
   Diff: 2
   Terms: stand-alone cost-allocation method
   Objective: 4
   AACSB: Ethical reasoning

9) Under the incremental method, the first incremental user usually receives the highest allocation of the common costs.
   Answer: FALSE
   Explanation: Under the incremental method of allocating common costs, the primary user receives the highest allocation of the common costs.
   Diff: 2
   Terms: incremental cost-allocation method
   Objective: 4
   AACSB: Reflective thinking

10) A common cost is a cost of operating a facility or activity that is shared by two or more users.
    Answer: TRUE
    Diff: 2
    Terms: common cost
    Objective: 4
    AACSB: Reflective thinking

11) Allocating common costs is clear-cut and can best be achieved by using the stand-alone cost-allocation method.
    Answer: FALSE
    Explanation: Allocating common costs is not clear-cut and can generate disputes. Whenever feasible, the rules for the allocation of common costs should be agreed on in advance.
    Diff: 2
    Terms: common cost
    Objective: 4
    AACSB: Reflective thinking

12) The stand-alone cost allocation method ranks the individual users of a cost object in order of users most responsible for a common cost and then uses these rankings to allocate the costs among the users.
    Answer: TRUE
    Diff: 2
    Terms: stand-alone cost-allocation method
    Objective: 4
    AACSB: Reflective thinking

13) The Shapley value method of allocating common costs considers each party as first the primary party and then the incremental party and computes an average allocation.
    Answer: TRUE
    Diff: 3
    Terms: incremental cost-allocation method
    Objective: 4
    AACSB: Reflective thinking
14) The Maintenance Department has been servicing Gizmo Production for four years. Beginning next year, the company is adding a Scrap-Processing Department to recycle the materials from Gizmo Production. As a result, maintenance costs are expected to increase from $480,000 per year to $500,000 per year. The Scrap-Processing Department will use 25% of the maintenance efforts.

**Required:**

a. Using the stand-alone cost-allocation method, identify the amount of maintenance cost that will be allocated to Gizmo Production and the Scrap-Processing Department next year.

b. Using the incremental cost-allocation method, identify the amount of maintenance cost that will be allocated to Gizmo Production and the Scrap-Processing Department next year.

**Answer:**

a. Gizmo Production = $500,000 × 0.75 = $375,000
   Scrap-Processing Department = $500,000 × 0.25 = $125,000

b. Gizmo Production would receive $480,000.
   Scrap-Processing Department would receive $20,000, the incremental amount

Diff: 1
Terms: stand-alone cost-allocation method, incremental cost-allocation method
Objective: 4
AACSB: Analytical skills

15) The Product Data Center has been servicing the Struble Production Casting Department for five years. Beginning next year, the company is adding a Production Molding Department to compliment the materials produced by the Struble Production Casting Department. As a result, data center costs are expected to increase from $700,000 per year to $800,000 per year. The Production Molding Department will use 20% of the data center efforts.

**Required:**

a. Using the stand-alone cost-allocation method, identify the amount of data center cost that will be allocated to Struble Production Casting and the Production Molding Department next year.

b. Using the incremental cost-allocation method, identify the amount of data center cost that will be allocated to Struble Production Casting and the Production Molding Department next year.

**Answer:**

a. Struble Production Casting Department = $800,000 × 0.80 = $640,000
   Production Molding = $800,000 × 0.20 = $160,000

b. Struble Production Casting Department would receive $700,000.
   Production Molding Department would receive $100,000, the incremental amount.

Diff: 1
Terms: stand-alone cost-allocation method, incremental cost-allocation method
Objective: 4
AACSB: Analytical skills
16) What is a "common cost"? What are two methods that a manager can use to allocate common costs to two or more users?
Answer: A common cost is the costs of a cost object that is shared by two or more users.

Two ways to allocate common costs would be the stand-alone method and the incremental method.

The stand-alone method uses information pertaining to each user of the cost object to determine the cost allocation weights.

The incremental method ranks individual users of the cost object and allocates common costs first to the primary user, and then to the other incremental users.

Diff: 2
Terms: stand-alone method, incremental method
Objective: 4
AACSB: Reflective thinking

Objective 15.5

1) All contracts with U.S. government agencies must comply with cost accounting standards issued by the:
A) FASB
B) SEC
C) IRS
D) CASB
Answer: D
Diff: 2
Terms: Cost Accounting Standards Board (CASB)
Objective: 5
AACSB: Analytical skills

2) Contract disputes regarding cost allocation can be reduced by defining:
A) the cost items allowed
B) the terms used, such as what constitutes direct labor
C) permissible cost-allocation bases
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: allowable costs
Objective: 5
AACSB: Reflective thinking
3) Cost-based prices:
A) are one way of setting prices in a competitive market
B) provide an inherit incentive for the producer to control costs
C) pass the majority of risk to the buyer
D) are required in all government contracts
Answer: C
Diff: 3
Terms: allowable costs
Objective: 5
AACSB: Reflective thinking

4) ______ is a cost that the contract parties agree to include in the costs to be reimbursed.
A) An allowable cost
B) An unallowable cost
C) An incremental cost
D) A stand-alone cost
Answer: A
Diff: 1
Terms: allowable costs
Objective: 5
AACSB: Reflective thinking

5) In certain high-cost defense contracts involving new weapons and equipment, contracts are rarely subject to competitive bidding because:
A) the government is concerned that one firm might monopolize defense contracts
B) there is an implicit agreement among defense contractors to "share contracts"
C) all defense contractors have essentially the same cost structure
D) None of these answers is correct.
Answer: D
Diff: 3
Terms: allowable costs
Objective: 5
AACSB: Ethical reasoning

6) All contracts with U.S. government agencies must comply with the cost accounting standards issued by the Government Accounting Standards Board (GASB).
Answer: FALSE
Explanation: All contracts with U.S. government agencies must comply with the cost accounting standards issued by the Cost Accounting Standards Board (CASB).
Diff: 1
Terms: Cost Accounting Standards Board (CASB)
Objective: 5
AACSB: Ethical reasoning
7) In costs-plus-fixed-fee contracts the allocation of a specific cost may be difficult to defend on the basis of any cause-and-effect reasoning.
Answer: TRUE
Diff: 2
Terms: cost-plus pricing
Objective: 5
AACSB: Analytical skills

8) If the government wants to contract a very large scale project with significant uncertainty about what the final cost will be; often a cost-plus contract is awarded to attract qualified contractors who may otherwise NOT be willing to accept the risks inherent in a guaranteed bid price.
Answer: TRUE
Diff: 2
Terms: cost-plus pricing
Objective: 5
AACSB: Analytical skills

9) The issue of "allowable costs" is NOT applicable in government cost-plus contracts.
Answer: FALSE
Explanation: The issue of "allowable costs" is very important in government cost-plus contracts.
Diff: 2
Terms: allowable costs
Objective: 5
AACSB: Analytical skills

10) John Peters is drafting the provisions of a cost-plus contract and is concerned with ironing out any possible misunderstandings during the life of the contract. What advice can you provide to reduce contract disputes over reimbursement amounts based on costs?
Answer: Disputes can be reduced by making the cost-allocation rules as explicit as possible and in writing. These rules should include details such as the allowable cost items, the acceptable cost-allocation bases, and how differences between budgeted and actual costs are to be accounted for.
Diff: 2
Terms: allowable costs
Objective: 5
AACSB: Reflective thinking
Objective 15.6

1) ________ occurs where revenues, related but NOT traceable to individual products, are assigned to those individual products.
A) Revenue tracing
B) Revenue allocation
C) Stand-alone pricing
D) Reciprocal pricing
Answer: B
Diff: 1
Terms: revenue allocation
Objective: 6
AACSB: Reflective thinking
2) An example of a revenue object is a:
A) customer
B) specific product
C) division of a company
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: revenue object
Objective: 6
AACSB: Reflective thinking

3) AAA offers towing services, auto routing, travel brochures, and other travel services for one annual fee. This is an example of:
A) revenue tracing
B) revenue allocation
C) a bundled product
D) a joint product
Answer: C
Diff: 2
Terms: bundled product
Objective: 6
AACSB: Analytical skills

4) Businesses offer bundled products to:
A) increase customer exposure
B) increase overall company profitability
C) avoid the problems of revenue allocation
D) Both A and B are correct.
Answer: D
Diff: 2
Terms: bundled product
Objective: 6
AACSB: Reflective thinking

5) ________ is a package of two or more products (or services) that is sold for a single price but whose individual components may be sold as separate items at their own "stand-alone" prices.
A) An assembly
B) A subassembly
C) A bundled product
D) A good deal
Answer: C
Diff: 1
Terms: bundled product
Objective: 6
AACSB: Reflective thinking
6) The method LEAST likely to cause disputes among product managers is:
A) stand-alone revenue-allocation method
B) incremental revenue-allocation method
C) the direct revenue-allocation method
D) All of these answers are correct.
Answer: A
Diff: 2
Terms: stand-alone cost-allocation method
Objective: 6
AACSB: Communication

7) The method that ranks individual products in a bundle for revenue allocation is the:
A) stand-alone revenue-allocation method
B) incremental revenue-allocation method
C) unit-cost weighting method
D) physical-unit weighting method
Answer: B
Diff: 2
Terms: incremental revenue-allocation method
Objective: 6
AACSB: Reflective thinking

8) Approaches used to rank products for revenue allocation might include:
A) surveying customers on the importance of each product
B) using recent data on stand-alone sales performance
C) having managers use their knowledge and intuition
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: incremental revenue-allocation method, revenue allocation
Objective: 6
AACSB: Analytical skills

9) To give more weight to the product that most likely drives the sales of the bundled product, the revenue allocation should be weighted using:
A) selling prices
B) unit costs
C) physical units
D) stand-alone product revenues
Answer: D
Diff: 2
Terms: stand-alone method
Objective: 6
AACSB: Reflective thinking
10) The revenue allocation may be weighted using physical units when:
A) the individual products within the bundle have approximately the same value
B) selling prices are unstable and unit costs are difficult to calculate
C) other methods cannot be used for various reasons
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: revenue allocation
Objective: 6
AACSB: Reflective thinking

Answer the following questions using the information below:

Buzz's Educational Software Outlet sells two or more of the video games as a single package. Managers are keenly interested in individual product-profitability figures. Information pertaining to three bundled products and the stand-alone prices is as follows:

<table>
<thead>
<tr>
<th></th>
<th>Stand-Alone Selling Price</th>
<th>Cost</th>
<th>Package</th>
<th>Packaged Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reading Fun</td>
<td>$25</td>
<td>$3.60</td>
<td>1. Reading Fun &amp; Math Fun</td>
<td>$44</td>
</tr>
<tr>
<td>Math Fun</td>
<td>$30</td>
<td>$4.00</td>
<td>2. Reading Fun &amp; Analysis</td>
<td>$56</td>
</tr>
<tr>
<td>Analysis</td>
<td>$45</td>
<td>$5.00</td>
<td>3. All three</td>
<td>$76</td>
</tr>
</tbody>
</table>

11) Using the stand-alone method with selling price as the weight for revenue allocation, what amount of revenue will be allocated to Reading Fun in the first package (Reading Fun & Math Fun)?
A) $20
B) $22
C) $19
D) $25
Answer: A
Explanation: A) \(\frac{$25}{($25 + $30)} \times $44 = $20\)
Diff: 2
Terms: stand-alone method, revenue allocation
Objective: 6
AACSB: Analytical skills
12) Using the incremental method for revenue allocation, what amount of revenue will be allocated to Reading Fun in the first package (Reading Fun & Math Fun)? Assume Reading Fun is the primary product, followed by Math Fun, and then Analysis.
A) $20
B) $22
C) $19
D) $25
Answer: D
Explanation: D) $25 since Reading Fun is the primary product.
Diff: 2
Terms: incremental method, revenue allocation
Objective: 6
AACSB: Analytical skills

13) Using the stand-alone method with selling price as the weight for revenue allocation, what amount of revenue will be allocated to Math Fun in the package that contains all three products?
A) $24.12
B) $30.00
C) $22.80
D) $25.33
Answer: C
Explanation: C) $30 / ($25 + $30 + $45) × $76 = $22.80
Diff: 2
Terms: stand-alone method, revenue allocation
Objective: 6
AACSB: Analytical skills

14) Using the incremental method, what amount of revenue will be allocated to Math Fun in the package that contains all three products?
A) $24.12
B) $30.00
C) $22.80
D) $25.33
Answer: B
Explanation: B) $76 - $25 primary product = $51 revenues remaining to be allocated to other products; $30 since there are revenues remaining to cover the selling price of Reading Fun, the first incremental product.
Diff: 2
Terms: incremental revenue-allocation method
Objective: 6
AACSB: Analytical skills
Answer the following questions using the information below:

The Appliance Store sells a refrigerator and a freezer as a single package for $1,000. Other data are in the chart below.

<table>
<thead>
<tr>
<th></th>
<th>Refrigerator</th>
<th>Full-size Freezer</th>
<th>Packaged Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Selling price</strong></td>
<td>$825</td>
<td>$375</td>
<td>$1,000</td>
</tr>
<tr>
<td><strong>Manufacturing cost per unit</strong></td>
<td>$620</td>
<td>$180</td>
<td></td>
</tr>
<tr>
<td><strong>Stand-alone product revenues</strong></td>
<td>$1,225,000</td>
<td>$775,000</td>
<td></td>
</tr>
</tbody>
</table>

15) Using the stand-alone method with selling price as the weight for revenue allocation, what amount will be allocated to the refrigerator?

A) $500.00
B) $825.00
C) $687.50
D) $625.00

Answer: C

Explanation: C) Refrigerator $825 / ($825 + $375) × $1,000 = $687.50

Diff: 2

Terms: stand-alone method, revenue allocation

Objective: 6

AACSB: Analytical skills

16) Using the stand-alone method with stand-alone product revenues as the weight for revenue allocation, what amount will be allocated to the refrigerator?

A) $687.50
B) $612.50
C) $625.00
D) $825.00

Answer: B

Explanation: B) Refrigerator $1,225,000 / ($1,225,000 + $775,000) × $1,000 = $612.50

Diff: 2

Terms: stand-alone method, revenue allocation

Objective: 6

AACSB: Analytical skills
17) Using the stand-alone method with manufacturing cost per unit as the weight for revenue allocation, what amount will be allocated to the refrigerator?
A) $500.00
B) $612.50
C) $620.00
D) $775.00
Answer: D
Explanation: D) Refrigerator $620 / ($620 + $180) × $1,000 = $775
Diff: 2
Terms: stand-alone method, revenue allocation
Objective: 6
AACSB: Analytical skills

18) Using the stand-alone method with physical units as the weight for revenue allocation, what amount will be allocated to the refrigerator?
A) $500
B) $20
C) $775
D) $825
Answer: A
Explanation: A) (1 / 2) × $1,000 = $500
Diff: 2
Terms: stand-alone method, revenue allocation
Objective: 6
AACSB: Analytical skills

19) An example of a bundled product is when a computer software manufacturer charges a single price for the spreadsheet, word processing, and presentation software on the same CD.
Answer: TRUE
Diff: 1
Terms: bundled product
Objective: 6
AACSB: Analytical skills

20) Revenue allocation is required to determine the profitability of individual items within a bundled product.
Answer: TRUE
Diff: 2
Terms: bundled product, revenue allocation
Objective: 6
AACSB: Reflective thinking

21) The stand-alone method may use selling price or unit costs to allocate revenues.
Answer: TRUE
Diff: 2
Terms: revenue allocation, stand-alone method
Objective: 6
AACSB: Reflective thinking
22) Revenue allocation based on the number of physical units is only appropriate when individual products in the bundle are of equal value.
Answer: TRUE
Explanation: Revenue allocation based on the number of physical units is only appropriate when individual products in the bundle are of equal value.
Diff: 2
Terms: revenue allocation
Objective: 6
AACSB: Reflective thinking

23) When allocating the revenues between a bundled product offering, there are only two methods which can be used: 1) the stand-alone revenue-method and 2) the incremental revenue-allocation method.
Answer: FALSE
Explanation: Although those are the formula-based methods, it is possible for management judgement to be used in issuing revenue-allocation weights.
Diff: 2
Terms: revenue allocation
Objective: 6
AACSB: Reflective thinking

24) Give examples of bundled products for each of the following industries:
a. Resort hotel
b. Bank
c. Restaurant
d. Computer store
e. Gasoline service station/convenience store
f. Software manufacturer
Answer:
a. Hotel room plus meals, free drinks, use of athletic facilities, morning newspaper
b. Checking account, safe deposit box, wire transfers, certified checks, travelers checks
c. Fixed-price meal includes a beverage, appetizer, entree, and dessert
d. Computer, keyboard, monitor, printer, software, 1-year contract for the repair and maintenance of the computer
e. Gasoline, car wash, coffee
f. Two (or more) software products
Diff: 2
Terms: bundled product
Objective: 6
AACSB: Analytical skills
25) Max's Movie Store encounters revenue-allocation decisions with its bundled product sales. Here, two or more of the movie videos are sold as a single package. Managers at Max's are keenly interested in individual product-profitability figures. Information pertaining to its three bundled products and the stand-alone selling prices of its individual products is as follows:

<table>
<thead>
<tr>
<th></th>
<th>Stand-Alone Selling Price, Cost</th>
<th>Package</th>
<th>Packaged Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Releases</td>
<td>$15 $2.00</td>
<td>New &amp; Older</td>
<td>$20</td>
</tr>
<tr>
<td>Older Releases</td>
<td>$10 $1.50</td>
<td>New &amp; Classics</td>
<td>$17</td>
</tr>
<tr>
<td>Classics</td>
<td>$8 $1.25</td>
<td>All three</td>
<td>$25</td>
</tr>
</tbody>
</table>

**Required:**

a. With selling prices as the weights, allocate the $25 packaged price of "All Three" to the three videos using the stand-alone revenue-allocation method.

b. Allocate the $25 packaged price of "All Three" to the three types of videos using the incremental revenue-allocation method. Assume New Releases is the primary product, followed by Older Releases, and then Classics.

**Answer:**

a. New $15 + Older $10 + Classics $8 = $33.00

\[
\begin{align*}
\text{New} & \quad \frac{15}{33} \times 25 = 11.36 \\
\text{Old} & \quad \frac{10}{33} \times 25 = 7.58 \\
\text{Classics} & \quad \frac{8}{33} \times 25 = 6.06 \\
\text{Total} & \quad \frac{33}{33} \times 25 = 25.00
\end{align*}
\]

b.

<table>
<thead>
<tr>
<th>Product</th>
<th>Revenue Allocated</th>
<th>Revenue Remaining To Be Allocated</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Releases</td>
<td>$15</td>
<td>$25 - $15 = $10</td>
</tr>
<tr>
<td>Older Releases</td>
<td>$10</td>
<td>$25 - $15 - $10 = $0</td>
</tr>
<tr>
<td>Classics</td>
<td>$0</td>
<td>none</td>
</tr>
<tr>
<td>Total revenue allocated</td>
<td>$25</td>
<td></td>
</tr>
</tbody>
</table>

Diff: 2
Terms: bundled product, revenue allocation
Objective: 6
AACSB: Analytical skills
26) Software For You encounters revenue-allocation decisions with its bundled product sales. Here, two or more units of the software are sold as a single package. Managers at Software For You are keenly interested in individual product-profitability figures. Information pertaining to its three bundled products and the stand-alone selling prices of its individual products is as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>Stand-Alone Selling Price</th>
<th>Cost</th>
<th>Package</th>
<th>Packaged Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Word Processing (WP)</td>
<td>$125</td>
<td>$18</td>
<td>WP &amp; SS</td>
<td>$220</td>
</tr>
<tr>
<td>Spreadsheet (SS)</td>
<td>$150</td>
<td>$20</td>
<td>WP &amp; AS</td>
<td>$280</td>
</tr>
<tr>
<td>Accounting Software (AS)</td>
<td>$225</td>
<td>$25</td>
<td>All three</td>
<td>$380</td>
</tr>
</tbody>
</table>

**Required:**

a. Using the stand-alone revenue-allocation method, allocate the $380 packaged price of "All Three" to the three software products
   1. with selling prices as the weights.
   2. with individual product costs as the weights.
   3. based on physical units.

b. Allocate the $380 packaged price of "All Three" to the three software products using the incremental revenue-allocation method. Assume Word Processing is the primary product, followed by Spreadsheet, and then Accounting Software.

**Answer:**

a1. WP $125 + SS $150 + AS $225 = $500
   
   \[
   \begin{align*}
   WP \frac{125}{500} \times 380 &= 95 \\
   SS \frac{150}{500} \times 380 &= 114 \\
   AS \frac{225}{500} \times 380 &= 171 \\
   \text{Total} &= 380
   \end{align*}
   \]

a2. WP $18 + SS $20 + AS $25 = $63
   
   \[
   \begin{align*}
   WP \frac{18}{63} \times 380 &= 108.57 \\
   SS \frac{20}{63} \times 380 &= 120.64 \\
   AS \frac{25}{63} \times 380 &= 150.79 \\
   \text{Total} &= 380.00
   \end{align*}
   \]

a3. \( 1 / (1+1+1) \times 380 = 126.67 \) per software package
b.

<table>
<thead>
<tr>
<th>Product</th>
<th>Revenue Allocated</th>
<th>Revenue Remaining To Be Allocated</th>
</tr>
</thead>
<tbody>
<tr>
<td>WP</td>
<td>$125</td>
<td>$380 - $125 = $255</td>
</tr>
<tr>
<td>SS</td>
<td>$150</td>
<td>$380 - $125 - $150 = $105</td>
</tr>
<tr>
<td>AS</td>
<td>$105</td>
<td>none</td>
</tr>
<tr>
<td>Total revenue allocated</td>
<td>$380</td>
<td></td>
</tr>
</tbody>
</table>

Diff: 2  
Terms: stand-alone method, incremental method, revenue allocation  
Objective: 6  
AACSB: Analytical skills

27) Why would businesses want to sell bundled products? What benefits, if any, are there for the consumer?  

Answer: Businesses seek to sell bundled products as a means of increasing total revenues and spreading fixed costs across a larger dollar amount of revenues. The result is usually an increase in overall corporate profitability.

For a company to sell more goods, customers must believe that they are getting value for their money.

Receiving additional goods or services for what is likely only a marginal increase in price over the price of the primary product could entice consumers to buy the bundled package rather than forgoing the purchase altogether. While not strictly a bundled product, an automobile provides a good example.

Car dealers sell cars that are "loaded with options." The price is less than the basic car with the options added separately. Consumers believe they are getting a benefit even though the car might have more options than they would have purchased. The manufacturer has greater revenue than would be the case without the "bundle."

A benefit for the consumer is an extra product for only a marginal increase in price that is probably less than the separate price of the products.  

Diff: 2  
Terms: bundled product  
Objective: 6  
AACSB: Reflective thinking
28) Describe and discuss the two methods of allocating revenues of a bundled package to the individual products in that package. Describe any special problems associated with the method.

Answer:

**Method 1.** The stand-alone revenue-allocation method allocates bundled revenues using product-specific information on the bundle of products as the weights to allocate the bundled revenues to the individual products. When allocating bundled revenues, the proportion of revenues is allocated on four alternative bases: (1) individual product unit selling prices, (2) individual product unit costs, (3) physical units, or (4) stand-alone product revenues. It is preferable to allocate common revenues based on unit revenues, since this best reflects customers’ willingness to pay for the different products. However, if the products are never sold separately, unit-selling prices are unavailable, so revenues are allocated based on unit costs (which should be available in the firm's accounting records), or simply by the number of physical units that comprise the bundle.

**Method 2.** The incremental revenue-allocation method ranks the individual products in the bundled product according to criteria determined by management. This ranking is then used to allocate the bundled revenues to individual products. One problem is how to determine the ranking. Individual product managers want to ranked first so that as much of the revenue as possible is allocated to their product. This can result in disputes between managers.

Diff: 2
Terms: bundled product, revenue allocation
Objective: 6
AACSB: Reflective thinking

Objective 15.7

1) Under the incremental revenue-allocation method, there is an incentive to be the last-ranked user.
Answer: FALSE
Explanation: Under the incremental revenue-allocation method, there is an incentive to be the first-ranked user.
Diff: 2
Terms: incremental revenue-allocation method, revenue allocation
Objective: 7
AACSB: Reflective thinking
Objective 16.1

1) What type of cost is the result of an event that results in more than one product or service simultaneously?
   A) byproduct cost
   B) joint cost
   C) main cost
   D) separable cost
   Answer: B
   Diff: 2
   Terms: joint costs
   Objective: 1
   AACSB: Reflective thinking

2) All costs incurred beyond the splitoff point that are assignable to one or more individual products are called:
   A) byproduct costs
   B) joint costs
   C) main costs
   D) separable costs
   Answer: D
   Diff: 2
   Terms: separable costs, splitoff point
   Objective: 1
   AACSB: Reflective thinking

3) In joint costing:
   A) costs are assigned to individual products as assembly of the product occurs
   B) costs are assigned to individual products as disassembly of the product occurs
   C) a single production process yields two or more products
   D) Both B and C are correct.
   Answer: D
   Diff: 3
   Terms: joint costs
   Objective: 1
   AACSB: Reflective thinking
4) The ________ point is the juncture in a joint production process when two or more products become separately identifiable.
A) splitoff
B) joint product
C) process
D) end
Answer: A
Diff: 3
Terms: splitoff point, main products, joint products
Objective: 1
AACSB: Reflective thinking

5) The focus of joint costing is on allocating costs to individual products:
A) before the splitoff point
B) after the splitoff point
C) at the splitoff point
D) at the end of production
Answer: C
Diff: 3
Terms: joint costs, splitoff point
Objective: 1
AACSB: Reflective thinking

6) When a single manufacturing process yields two products, one of which has a relatively high sales value compared to the other, the two products are respectively known as:
A) joint products and byproducts
B) joint products and scrap
C) main products and byproducts
D) main products and joint products
Answer: C
Diff: 2
Terms: main products, byproducts
Objective: 1
AACSB: Reflective thinking

7) When a joint production process yields two or more products with high total sales values, these products are called:
A) main products
B) joint products
C) byproducts
D) scrap
Answer: B
Diff: 2
Terms: joint products
Objective: 1
AACSB: Reflective thinking
8) Byproducts and main products are differentiated by the:
A) number of units per processing period
B) weight or volume of outputs per period
C) amount of total sales value
D) None of these answers is correct.
Answer: C
Diff: 2
Terms: byproducts, main products
Objective: 1
AACSB: Reflective thinking

9) All of the following changes may indicate a change in product classification of a manufacturing process which has a splitoff point EXCEPT a:
A) byproduct increases in sales value due to a new application
B) main product becomes a joint product
C) main product becomes technologically obsolete
D) byproduct loses its market due to a new invention
Answer: B
Diff: 2
Terms: splitoff point, main products, joint products
Objective: 1
AACSB: Reflective thinking

10) Which of the following methods of allocating costs use market-based data?
A) Sales value at splitoff method
B) Estimated net realizable value method
C) The constant gross-margin percentage method
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: sales value at splitoff, NRV, constant gross-margin percentage NRV method
Objective: 1
AACSB: Reflective thinking

11) Products with a relatively low sales value are known as:
A) scrap
B) main products
C) joint products
D) byproducts
Answer: D
Diff: 1
Terms: byproducts
Objective: 1
AACSB: Reflective thinking
12) Which of the following statements is true regarding main products and byproducts?
A) Product classifications do not change over the short run.
B) Product classifications do not change over the long run.
C) Product classifications may change over time.
D) The cause-and-effect criterion determines the classification.
Answer: C
Diff: 3
Terms: main products, byproducts
Objective: 1
AACSB: Reflective thinking

13) Outputs with zero sales value are accounted for by:
A) listing these various outputs in a footnote to the financial statements
B) including the items as a relatively small portion of the value assigned to the products produced during the accounting period
C) making journal entries to reflect an estimate of possible values
D) None of these answers is correct.
Answer: D
Diff: 3
Terms: byproducts
Objective: 1
AACSB: Reflective thinking

14) Outputs with a negative sales value are:
A) added to cost of goods sold
B) added to joint production costs and allocated to joint or main products
C) added to joint production costs and allocated to byproducts and scrap
D) subtracted from product revenue
Answer: B
Diff: 3
Terms: main products, byproducts
Objective: 1
AACSB: Reflective thinking

15) Joint costs are incurred beyond the splitoff point and are assignable to individual products.
Answer: FALSE
Explanation: Joint costs are incurred prior to the splitoff.
Diff: 2
Terms: joint costs, splitoff point
Objective: 1
AACSB: Reflective thinking

16) Separable costs are incurred beyond the splitoff point that are assignable to each of the specific products identified at the splitoff point.
Answer: TRUE
Diff: 2
Terms: separable costs, splitoff point
Objective: 1
AACSB: Reflective thinking
17) Separable costs include manufacturing costs only.
Answer: FALSE
Explanation: Separable costs include manufacturing, marketing, distribution, and other costs.
Diff: 2
Terms: separable costs, splitoff point
Objective: 1
AACSB: Reflective thinking

18) The focus of joint costing is assigning costs to individual products as assembly occurs.
Answer: FALSE
Explanation: The focus is accumulating costs incurred on the joint products.
Diff: 2
Terms: joint costs
Objective: 1
AACSB: Reflective thinking

19) Joint costs are the costs of a production process that yields multiple products simultaneously.
Answer: TRUE
Diff: 1
Terms: joint costs
Objective: 1
AACSB: Reflective thinking

20) The juncture in a joint production process when two products become separable is the byproduct point.
Answer: FALSE
Explanation: The juncture in a joint production process when two products become separable is the splitoff point.
Diff: 1
Terms: byproducts, splitoff point
Objective: 1
AACSB: Reflective thinking

21) At or beyond the splitoff point, decisions relating to the sale or further processing of each identifiable product can be made independently of decisions about the other products.
Answer: TRUE
Diff: 1
Terms: splitoff point, main products, joint products
Objective: 1
AACSB: Reflective thinking

22) The products of a joint production process that have low total sales values compared with the total sales value of the main product are called joint products.
Answer: FALSE
Explanation: They are called byproducts.
Diff: 1
Terms: byproducts, joint products
Objective: 1
AACSB: Reflective thinking
23) The products of a joint production process that have low total sales values compared with the total sales value of the main product or of joint products are called byproducts.
Answer: TRUE
Diff: 2
Terms: byproducts
Objective: 1
AACSB: Reflective thinking

24) All products yielded from joint product processing have some positive value to the firm.
Answer: FALSE
Explanation: Not all products yielded from joint product processing have some positive value to the firm.
Diff: 1
Terms: byproducts, joint products
Objective: 1
AACSB: Reflective thinking

25) If the value of a joint product drops significantly, it could also be viewed as a byproduct.
Answer: TRUE
Diff: 1
Terms: byproducts, joint products
Objective: 1
AACSB: Reflective thinking

26) In each of the following industries, identify possible joint (or severable) products at the splitoff point.
   a. Coal
   b. Petroleum
   c. Dairy
   d. Lamb
   e. Lumber
   f. Cocoa Beans
   g. Christmas Trees
   h. Salt
   i. Cowhide
Answer:
   a. Coke, Gas, Benzole, Tar, Ammonia
   b. Crude Oil, Gas, Raw LPG
   c. Milk, Butter, Cheese, Ice Cream, Skim Milk
   d. Lamb Cuts, Tripe, Hides, Bones, Fat
   e. Board, Newsprint, Shavings, Chips, etc.
   f. Cocoa Butter, Cocoa Powder, Cocoa Shells
   g. Christmas Trees, Wreaths, Decorations
   h. Hydrogen, Chlorine, Caustic Soda
   i. Leather, Suede, Chew Toys
Diff: 1
Terms: joint products, splitoff point
Objective: 1
AACSB: Analytical skills
27) Define the terms main product, joint product, and byproduct. Give at least one example of each type of product.

Answer: Main product - When one product has a high total sales value compared with the total sales value of other products of the process. Ex. timber processed into lumber

Joint product - When a joint production process yields two or more products with high total sales value compared with the total sales value of other products. Ex. crude oil processed into gasoline and kerosene

Byproduct - Products of a joint production process that have low total sales value compared with the total sales value of the main product or joint products. Ex. woodchips created when timber processed into lumber

Diff: 1
Terms: main products, byproducts
Objective: 1
AACSB: Reflective thinking

28) Silver Company uses one raw material, silver ore, for all of its products. It spends considerable time getting the silver from the ore before it starts the actual processing of the finished products, rings, lockets, etc. Traditionally, the company made one product at a time and charged the product with all costs of production, from ore to final inspection. However, in recent months, the cost accounting reports have been somewhat disturbing to management. It seems that some of the finished products are costing more than they should, even to the point of approaching their retail value. It has been noted by the accounting manager that this problem began when the company started buying ore from different parts of the world, some of which require difficult extraction methods.

**Required:**
Can you explain how the company might change its accounting system to reflect the reporting problems better? Are there other problems with the purchasing area?

Answer: It appears that the company needs to start assigning all extraction costs to a joint-cost category. It is unfair that the finished products receive a high cost simply because a certain batch of ore was very expensive to run through the extraction process when the next finished products were produced from silver that was easy to extract.

If all extraction costs are considered joint, then each finished product would share in the average cost of extraction, rather than being charged with the cost of a specific batch. This should result in costs that are more reflective of the product's actual cost.

Additional problems may be with the purchasing department. The accounting department may help highlight the problem but it does not pinpoint the actual problem. Maybe the company should buy refined silver or else hire experts in the minerals area as part of the purchasing team.

Diff: 2
Terms: joint costs
Objective: 1
AACSB: Reflective thinking
29) What are a joint cost and a splitoff point?
Answer: A joint cost is the cost of a single production process that yields multiple products simultaneously. The splitoff point is the juncture in a joint production process when the products become separately identifiable.
Diff: 2
Terms: joint costs, splitoff point
Objective: 1
AACSB: Reflective thinking

30) Explain the difference between a joint product and a byproduct. Can a byproduct ever become a joint product?
Answer: The differentiating factor between a joint product and a byproduct is the sales value at the splitoff point. Joint products have high total sales value at the splitoff point. A byproduct has a low total sales value at the splitoff point. Products can change from byproducts to joint products when their total sales values increase significantly.
Diff: 2
Terms: byproducts, joint products, splitoff point
Objective: 1
AACSB: Reflective thinking

Objective 16.2

1) Which of the following is a reason to allocate joint costs?
A) rate regulation requirements, if applicable
B) cost of goods sold computations
C) insurance settlement cost information requirements
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: joint costs
Objective: 2
AACSB: Reflective thinking

2) A business which enters into a contract to purchase a product (or products) and will compensate the manufacturer under a cost reimbursement formula, should take an active part in the determination of how joint costs are allocated because:
A) the manufacturer will attempt to allocate as large a portion of its costs to these products
B) if the manufacturer successfully allocates a large portion of its costs to these products then it will be able to sell its other nonreimbursed products at lower prices
C) the FASB requires the business to participate in the cost allocation process
D) Both A and B are correct.
Answer: D
Diff: 3
Terms: joint costs
Objective: 2
AACSB: Reflective thinking
3) Proper costs allocation for inventory costing and cost-of-goods-sold computations are important because:
A) inventory costing is essential for proper balance sheet presentation
B) most states have laws requiring proper balance sheet presentation and recommended allocation methods
C) cost of goods sold is an important component in the determination of net income
D) Both A and C are correct.
Answer: D
Diff: 3
Terms: joint costs
Objective: 2
AACSB: Reflective thinking

4) Which of the following is NOT a primary reason for allocating joint costs?
A) cost justification and insurance settlement cost information requirements
B) cost justification and asset measurement
C) income measurement and rate regulation requirements
D) to calculate the bonus of the chief executive officer
Answer: D
Diff: 1
Terms: joint costs
Objective: 2
AACSB: Reflective thinking

5) Joint costs are NOT allocated to individual products for the preparation of tax returns.
Answer: FALSE
Explanation: Joint costs are allocated for reporting to tax authorities.
Diff: 1
Terms: joint costs
Objective: 2
AACSB: Reflective thinking

6) Litigation may be a reason that joint costs are allocated to individual products.
Answer: TRUE
Diff: 1
Terms: joint costs
Objective: 2
AACSB: Reflective thinking
7) List three reasons why we allocate joint costs to individual products or services. Give an example of when the particular cost allocation reason would come into use.

Answer:

a. *For inventory costing, and cost of goods sold computations for financial accounting purposes.*  
   Example: Cost of goods sold and ending inventory valuation is necessary for reports to shareholders and for the inland revenue service.

b. *For internal costing and cost of goods sold computations for internal reporting purposes.*  
   Example: These computations are necessary for division profitability analysis.

c. *Reimbursement under contracts.*  
   Example: A firm produces multiple products or services-and uses the same resources and facilities to produce the products or services. But not all the firm's products are under the contract. The firm must allocate the cost of these shared facilities or resources to reflect the portion used by the product under the contract.

d. *Insurance settlement computations.*  
   Example: Where a business with multiple products or services claim losses under an insurance policy and wants to calculate the loss. The insurance company and the insured must agree on the value of the loss.

e. *Rate regulation.* When companies are subject to rate regulation, the allocation of joint costs can be a significant factor in determining the regulated rates.  
   Example: Crude oil and natural gas are produced out of a common well.

Diff: 1  
Terms: joint costs  
Objective: 2  
AACSB: Reflective thinking

8) What are six reasons that joint costs should be allocated to individual products or services?

Answer: The first reason joint costs should be allocated to compute inventoriable costs and cost of goods sold is for financial accounting purposes and for income tax reporting. The second reason the costs should be allocated to also allow for computing cost of goods sold and inventoriable costs for internal reporting purposes to compute division profits and to evaluate division managers. The third reason that joint costs need to be allocated is so that costs will be reimbursed under contracts using a cost plus system, often found in government contracts. A fourth reason for the cost allocation is to allow for proper valuation and settlement in insurance claims for damages. A fifth reason is that joint products may be regulated and proper costing is essential. The sixth reason for allocating joint costs is to support litigation where the joint product is a key input.

Diff: 2  
Terms: joint costs  
Objective: 2  
AACSB: Reflective thinking
Objective 16.3

1) All of the following methods may be used to allocate joint costs EXCEPT the:
A) constant gross-margin percentage method
B) estimated net realizable value method
C) present value allocation method
D) sales value at splitoff method
Answer: C
Diff: 2
Terms: jnt costs, constant gross-margin % NRV, NRV, and sales value at splitoff method
Objective: 3
AACSB: Reflective thinking

2) An example of a market-based approach to allocating joint costs is (are) allocating joint costs based on:
A) sales value at splitoff method
B) physical volume
C) constant gross-margin percentage method
D) Both A and C are correct.
Answer: D
Diff: 3
Terms: sales value at splitoff, constant gross-margin percentage NRV method
Objective: 3
AACSB: Reflective thinking

3) Which of the following is NOT a market-based approach to allocating costs?
A) sales value at splitoff
B) constant gross-margin percentage NRV
C) physical measures
D) net realizable value
Answer: C
Diff: 3
Terms: sales value at splitoff, NRV, const gross-margin % NRV, phys-measure method
Objective: 3
AACSB: Reflective thinking

4) The sales value at splitoff method:
A) allocates joint costs to joint products on the basis of the relative total sales value at the splitoff point
B) allocates joint costs to joint products on the basis of a comparable physical measure at the splitoff point
C) allocates joint costs to joint products on the basis of relative NRV
D) allocates joint costs to joint products in a way that each product has an identical gross-margin percentage
Answer: A
Diff: 3
Terms: sales value at splitoff method
Objective: 3
AACSB: Reflective thinking
5) The physical-measure method:
A) allocates joint costs to joint products in a way that each product has an identical gross-margin percentage
B) allocates joint costs to joint products on the basis of a comparable physical measure at the splitoff point
C) allocates joint costs to joint products on the basis of the relative sales value at the splitoff point
D) allocates joint costs to joint products on the basis of relative NRV
Answer: B
Diff: 3
Terms: physical-measure method
Objective: 3
AACSB: Reflective thinking

6) The net realizable value method:
A) allocates joint costs to joint products on the basis of a comparable physical measure at the splitoff point
B) allocates joint costs to joint products on the basis of the relative sales value at the splitoff point
C) allocates joint costs to joint products in a way that each product has an identical gross-margin percentage
D) allocates joint costs to joint products on the basis of relative NRV
Answer: D
Diff: 3
Terms: net-realizable value (NRV) method
Objective: 3
AACSB: Reflective thinking

7) Which of the following statements is true in regard to the cause-and-effect relationship between allocated joint costs and individual products?
A) A high individual product value results in a high level of joint costs.
B) A low individual product value results in a low level of joint costs.
C) A high individual product value results in a low level of joint costs.
D) There is no cause-and-effect relationship.
Answer: D
Diff: 3
Terms: joint costs
Objective: 3
AACSB: Reflective thinking

8) The benefits-received criteria for allocating joint costs indicate market-based measures are preferred because:
A) physical measures such as volume are a clearer basis for allocating cost than other measures
B) other measures are more difficult to calculate
C) revenues are usually the best indicator of the benefits received
D) None of these answers is correct.
Answer: C
Diff: 1
Terms: joint costs
Objective: 3
AACSB: Reflective thinking
Answer the following questions using the information below:

Yakima Manufacturing purchases trees from Cheney Lumber and processes them up to the splitoff point where two products (paper and pencil casings) are obtained. The products are then sold to an independent company that markets and distributes them to retail outlets. The following information was collected for the month of November:

_Trees processed:_ 100 trees (yield is 60,000 sheets of paper and 60,000 pencil casings and no scrap)

_Production:_
- paper 60,000 sheets
- pencil casings 60,000

_Sales:_
- paper 58,000 at $0.04 per page
- pencil casings 60,000 at $0.10 per casing

The cost of purchasing 100 trees and processing them up to the splitoff point to yield 60,000 sheets of paper and 60,000 pencil casings is $3,000.

Yakima's accounting department reported no beginning inventories and an ending inventory of 2,000 sheets of paper.

9) What is the sales value at the splitoff point for paper?
   A) $240
   B) $2,320
   C) $2,400
   D) $3,900
   Answer: C
   Explanation: C) Paper: 60,000 sheets × $0.04 = $2,400.00
   Diff: 2
   Terms: sales value at splitoff method, splitoff point
   Objective: 3
   AACSB: Analytical skills

10) What is the sales value at the splitoff point of the pencil casings?
    A) $600
    B) $2,460
    C) $6,000
    D) $7,500
    Answer: C
    Explanation: C) Pencils: 60,000 casings × $0.10 = $6,000.00
    Diff: 1
    Terms: sales value at splitoff method, splitoff point
    Objective: 3
    AACSB: Analytical skills
11) If the sales value at splitoff method is used, what are the approximate joint costs assigned to ending inventory for paper?
A) $28.58
B) $100.00
C) $870.00
D) $1,500.00
Answer: A
Explanation:
A) Paper: 60,000 sheets × $0.04 = $2,400.00
$2,400/($2,400 + $6,000) = 28.57%
28.57% × $3,000 × 2,000/60,000 = $28.58
Diff: 3
Terms: sales value at splitoff method, splitoff point
Objective: 3
AACSB: Analytical skills

12) If the sales value at splitoff method is used, what is the approximate production cost for each pencil casing?
A) $0.0250
B) $0.0255
C) $0.0335
D) $0.0357
Answer: D
Explanation:
D) Paper: 60,000 sheets × $0.04 = $2,400.00
$6,000/($2,400 + $6,000) × $3,000 = $2,142
$2,142/60,000 casings = $0.0357
Diff: 3
Terms: sales value at splitoff method, splitoff point
Objective: 3
AACSB: Analytical skills
13) Yakima Manufacturing purchases trees from Cheney Lumber and processes them up to the splitoff point where two products (paper and pencil casings) are obtained. The products are then sold to an independent company that markets and distributes them to retail outlets. The following information was collected for the month of May:

*Trees processed:* 100 trees (yield is 70,000 sheets of paper and 60,000 pencil casings and no scrap)

*Production:* paper 70,000 sheets  
               pencil casings 60,000

*Sales:* paper 68,000 at $0.04 per page  
          pencil casings 60,000 at $0.10 per casing

The cost of purchasing 100 trees and processing them up to the splitoff point to yield 70,000 sheets of paper and 60,000 pencil casings is $3,000.

Yakima's Manufacturing's accounting department reported no beginning inventories and an ending inventory of 2,000 sheets of paper.

What are the paper's and the pencils' approximate weighted cost proportions using the sales value at splitoff method, respectively?
A) 50.00% and 50.00%  
B) 33.33% and 66.67%  
C) 31.82% and 68.18%  
D) None of these answers is correct.

Answer: C

Explanation:
C) \((70,000 \times $0.04) + (60,000 \times $0.10) = $8,800\)
\($2,800/$8,800 = 31.82\%\)
\($6,000/$8,800 = 68.18\%\)

Diff: 2
Terms: sales value at splitoff method, splitoff point
Objective: 3
AACSB: Analytical skills
14) The Arvid Corporation manufactures widgets, gizmos, and turnbols from a joint process. May production is 2,000 widgets; 3,500 gizmos; and 4,000 turnbols. Respective per unit selling prices at splitoff are $30, $20, and $10. Joint costs up to the splitoff point are $75,000. If joint costs are allocated based upon the sales value at splitoff, what amount of joint costs will be allocated to the widgets?
A) $30,882
B) $26,471
C) $17,647
D) $28,125
Answer: B
Explanation:
B) $30 \times 2,000 = $60,000
$20 \times 3,500 = $70,000
$10 \times 4,000 = $40,000
Total = $170,000
$60,000/$170,000 \times $75,000 = $26,471
Diff: 2
Terms: sales value at splitoff method, splitoff point
Objective: 3
AACSB: Analytical skills

15) Product X is sold for $32 a unit and Product Y is sold for $48 a unit. Each product can also be sold at the splitoff point. Product X can be sold for $10 and Product Y for $8. Joint costs for the two products totaled $2,000 for January for 300 units of X and 250 units of Y. What are the respective joint costs assigned each unit of products X and Y if the sales value at splitoff method is used?
A) $2.96 and $4.44
B) $4.00 and $4.55
C) $4.00 and $3.20
D) $4.55 and $4.55
Answer: C
Explanation:
C) Total splitoff market value = (300 \times $10) + (250 \times $8) = $5,000
Product X = $3,000/$5,000 \times $2,000 = $1,200/300 = $4.00
Product Y = $2,000/$5,000 \times $2,000 = $800/250 = $3.20
Diff: 2
Terms: sales value at splitoff method, splitoff point
Objective: 3
AACSB: Analytical skills

16) A reason why a physical-measure to allocate joint costs is less preferred than the sales value at splitoff is:
A) a physical measure such as volume is difficult to estimate because of shrinkage
B) physical volume usually has little relationship to the revenue producing power of products
C) a physical measure usually results in the costs being allocated to the product that weighs the most
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: physical-measure method, sales value at splitoff method
Objective: 3
AACSB: Reflective thinking
Answer the following questions using the information below:

The Oxnard Corporation processes a liquid component up to the splitoff point where two products, Mr. DirtOut and Mr. SinkClean, are produced and sold. There was no beginning inventory. The following material was collected for the month of January:

**Direct materials processed:** 250,000 gallons (242,500 gallons of good product)

**Production:**
- Mr. DirtOut: 147,500 gallons
- Mr. SinkClean: 95,000 gallons

**Sales:**
- Mr. DirtOut: 140,500 at $110 per gallon
- Mr. SinkClean: 91,000 at $100 per gallon

The cost of purchasing 250,000 gallons of direct materials and processing it up to the splitoff point to yield a total of 242,500 gallons of good product was $760,000.

17) What are the physical-volume proportions to allocate joint costs for Mr. DirtOut and Mr. SinkClean, respectively?
   A) 59.00% and 41.00%
   B) 60.82% and 39.18%
   C) 39.18% and 60.82%
   D) 59.79% and 40.21%

   Answer: B
   Explanation:
   B) Mr. DirtOut: 147,500/242,500 = 60.82%
   Mr. SinkClean: 95,000/242,500 = 39.18%
   Diff: 2
   Terms: physical-measure method
   Objective: 3
   AACSB: Analytical skills

18) When using a physical-volume measure, what is the approximate amount of joint costs that will be allocated to Mr. DirtOut and Mr. SinkClean?
   A) $464,232 and $297,768
   B) $448,400 and $311,600
   C) $454,404 and $305,596
   D) $461,252 and $298,748

   Answer: A
   Explanation:
   A) $760,000 × (147,500 / 242,500) = $464,232; $760,000 × (95,000 / 242,500) = $297,768
   Diff: 2
   Terms: physical-measure method
   Objective: 3
   AACSB: Analytical skills
19) When using the physical-volume method, what is Mr. DirtOut's approximate production cost per unit?  
A) $3.02  
B) $3.08  
C) $3.14  
D) $3.22  
Answer: C  
Explanation: C) \( \frac{\$760,000 \times (147,500 / 242,500)}{147,500} = $3.14 \)  
Diff: 3  
Terms: physical-measure method  
Objective: 3  
AACSB: Analytical skills

20) Argon Manufacturing Company processes direct materials up to the splitoff point where two products (U and V) are obtained and sold. The following information was collected for last quarter of the calendar year:

**Direct materials processed:** 20,000 gallons (20,000 gallons yield 19,000 gallons of good product and 1,000 gallons of shrinkage)

**Production:**  
U 10,000 gallons  
V 9,000 gallons  

**Sales:**  
U 9,500 at $150 per gallon  
V 8,000 at $100 per gallon

The cost of purchasing 20,000 gallons of direct materials and processing it up to the splitoff point to yield a total of 19,000 gallons of good products was $1,950,000.

Beginning inventories totaled 100 gallons for U and 50 gallons for V. Ending inventory amounts reflected 600 gallons of Product U and 1,050 gallons of Product V. October costs per unit were the same as November.

What are the physical-volume proportions for products U and V, respectively?  
A) 47.37% and 53.63%  
B) 55.00% and 45.00%  
C) 52.63% and 47.37%  
D) 54.00% and 46.00%  
Answer: C  
Explanation: C)  
X: \( \frac{10,000}{10,000 + 9,000} = \frac{10,000}{19,000} = 52.63\% \)  
Y: \( \frac{9,000}{10,000 + 9,000} = \frac{9,000}{19,000} = 47.37\% \)  
Diff: 3  
Terms: physical-measure method  
Objective: 3  
AACSB: Analytical skills
Answer the following questions using the information below:

The Gows Company processes unprocessed goat milk up to the splitoff point where two products, condensed goat milk and skim goat milk result. The following information was collected for the month of October:

Direct Materials processed: 130,000 gallons (shrinkage was 10%)

Production:
- condensed goat milk 52,200 gallons
- skim goat milk 64,800 gallons

Sales:
- condensed goat milk $3.50 per gallon
- skim goat milk $2.50 per gallon

The costs of purchasing the 130,000 gallons of unprocessed goat milk and processing it up to the splitoff point to yield a total of 117,000 gallons of salable product was $144,480. There were no inventory balances of either product.

Condensed goat milk may be processed further to yield 39,000 gallons (the remainder is shrinkage) of a medicinal milk product, Xyla, for an additional processing cost of $3 per usable gallon. Xyla can be sold for $18 per gallon.

Skim goat milk can be processed further to yield 56,200 gallons of skim goat ice cream, for an additional processing cost per usable gallon of $2.50. The product can be sold for $9 per gallon.

There are no beginning and ending inventory balances.

21) What is the estimated net realizable value of Xyla at the splitoff point?
A) $365,300
B) $505,800
C) $585,000
D) $702,000

Answer: C

Explanation:

<table>
<thead>
<tr>
<th></th>
<th>XYLA</th>
<th>Skim Goat</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>39,000 × $18 = $702,000</td>
<td>56,200 × $9 = $505,800</td>
<td>$1,207,800</td>
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<tr>
<td>Less: Sep cost</td>
<td>39,000 × $3 = $117,000</td>
<td>56,200 × $2.50 = $140,500</td>
<td></td>
</tr>
<tr>
<td>Est. NRValue</td>
<td>$585,000</td>
<td>$365,300</td>
<td>$950,300</td>
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<td>Weighting</td>
<td>.6156</td>
<td>.3844</td>
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<tr>
<td>Jt costs allocated</td>
<td>$144,480 × .6156 = $88,942</td>
<td>$144,480 × .3844 = $55,538</td>
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</tr>
</tbody>
</table>

Diff: 3
Terms: net-realizable value (NRV) method
Objective: 3
AACSB: Analytical skills
22) What is the estimated net realizable value of the skim goat ice cream at the splitoff point?
A) $365,300  
B) $505,800  
C) $220,400  
D) $170,900  
Answer: A  
Explanation: A)

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<tr>
<td>Jt costs allocated</td>
<td>$88,942</td>
<td>$55,538</td>
<td></td>
</tr>
</tbody>
</table>

23) Using estimated net realizable value, what amount of the $72,240 of joint costs would be allocated to Xyla and the skim goat ice cream?
A) $83,942 and $60,538  
B) $88,942 and $55,538  
C) $65,592 and $78,888  
D) $144,480 and $72,140  
Answer: B  
Explanation: B)

<table>
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</table>

Diff: 3  
Terms: net-realizable value (NRV) method  
Objective: 3  
AACSB: Analytical skills
24) Using the sales value at splitoff method, what is the gross-margin percentage for condensed goat milk at the splitoff point?
A) 21.1%
B) 55.1%
C) 58.1%
D) 38.2%
Answer: C
Explanation: 

<table>
<thead>
<tr>
<th></th>
<th>Condensed Goat Milk</th>
<th>Skim Goat Milk</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$182,700</td>
<td>$162,000</td>
<td>$344,700</td>
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<tr>
<td>Percentage</td>
<td>0.53</td>
<td>0.47</td>
<td></td>
</tr>
<tr>
<td>Separable costs</td>
<td>$76,574</td>
<td>$67,906</td>
<td></td>
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<tr>
<td>Gross margin</td>
<td>$106,126</td>
<td>$94,094</td>
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</tr>
<tr>
<td>GM percentage</td>
<td>0.581</td>
<td>0.581</td>
<td></td>
</tr>
</tbody>
</table>

Diff: 3
Terms: sales value at splitoff method, splitoff point
Objective: 3
AACSB: Analytical skills

25) Using the sales value at splitoff method, what is the gross-margin percentage for skim goat milk at the splitoff point?
A) 21.1%
B) 55.1%
C) 58.1%
D) 38.2%
Answer: C
Explanation: 

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</table>
26) How much (if any) extra income would Morton earn if it produced and sold all of the Xyla from the condensed goat milk? Allocate joint processing costs based upon relative sales value on the splitoff. (Extra income means income in excess of what Morton would have earned from selling condensed goat milk.)
A) $106,126
B) $508,426
C) $402,300
D) $193,574
Answer: C
Explanation: C)

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<tr>
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</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>$702,000</td>
<td>$505,800</td>
</tr>
<tr>
<td>Joint costs (see #55)</td>
<td>(76,574)</td>
<td>(67,906)</td>
</tr>
<tr>
<td>Process costs</td>
<td>($3 \times 39,000) = (117,000)</td>
<td>($2.50 \times 56,20000) = (140,500)</td>
</tr>
<tr>
<td>Revenue (net)</td>
<td>508,426</td>
<td>297,394</td>
</tr>
<tr>
<td>Gross margin (see #55)</td>
<td>(106,126)</td>
<td>(94,094)</td>
</tr>
<tr>
<td>Difference</td>
<td>$402,300</td>
<td>$203,300</td>
</tr>
</tbody>
</table>

27) How much (if any) extra income would Morton earn if it produced and sold skim milk ice cream from goats rather than goat skim milk? Allocate joint processing costs based upon the relative sales value at the splitoff point.
A) $94,094
B) $234,594
C) $203,300
D) $140,500
Answer: C
Explanation: C)

<table>
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<tr>
<td>Difference</td>
<td>$402,300</td>
<td>$203,300</td>
</tr>
</tbody>
</table>
28) Chem Manufacturing Company processes direct materials up to the splitoff point where two products (X and Y) are obtained and sold. The following information was collected for the month of November:

**Direct materials processed:** 10,000 gallons (10,000 gallons yield 9,500 gallons of good product and 500 gallons of shrinkage)

**Production:**
- X: 5,000 gallons
- Y: 4,500 gallons

**Sales:**
- X: 4,750 at $150 per gallon
- Y: 4,000 at $100 per gallon

The cost of purchasing 10,000 gallons of direct materials and processing it up to the splitoff point to yield a total of 9,500 gallons of good products was $975,000.

The beginning inventories totaled 50 gallons for X and 25 gallons for Y. Ending inventory amounts reflected 300 gallons of Product X and 525 gallons of Product Y. October costs per unit were the same as November.

Using the physical-volume method, what is Product X's approximate gross-margin percentage?

| A) 32% |
| B) 33% |
| C) 35% |
| D) 38% |

**Answer: A**

**Explanation:**

\[
\text{Sales} = 4,750 \times 150 = 712,500 \\
\text{Cost of Goods Sold} = 4,750 \times \frac{513,142}{5,000} = 487,485 \\
\text{Gross Margin} = 225,015 \\
\]

\[
\frac{5,000}{5,000 + 4,500} = 0.5263 \times 975,000 = 513,142 \\
\text{Gross-margin percentage} = \frac{225,015}{712,500} = 0.32 \text{ rounded} \\
\]

**Diff: 2**

**Terms:** physical-measure method

**Objective:** 3

**AACSB:** Analytical skills
29) Beverage Drink Company processes direct materials up to the splitoff point where two products, A and B, are obtained. The following information was collected for the month of July:

<table>
<thead>
<tr>
<th>Direct materials processed:</th>
<th>2,500 liters (with 20% shrinkage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>1,500 liters</td>
</tr>
<tr>
<td>B</td>
<td>500 liters</td>
</tr>
<tr>
<td>Sales</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>$15.00 per liter</td>
</tr>
<tr>
<td>B</td>
<td>$10.00 per liter</td>
</tr>
</tbody>
</table>

The cost of purchasing 2,500 liters of direct materials and processing it up to the splitoff point to yield a total of 2,000 liters of good products was $4,500. There were no inventory balances of A and B.

Product A may be processed further to yield 1,375 liters of Product Z5 for an additional processing cost of $150. Product Z5 is sold for $25.00 per liter. There was no beginning inventory and ending inventory was 125 liters.

Product B may be processed further to yield 375 liters of Product W3 for an additional processing cost of $275. Product W3 is sold for $30.00 per liter. There was no beginning inventory and ending inventory was 25 liters.

If Product Z5 and Product W3 are produced, what are the expected sales values of production, respectively?

A) $11,250 and $34,375
B) $22,500 and $5,000
C) $31,250 and $10,500
D) $34,375 and $11,250

Answer: D

Explanation:
D) Z5 = 1,375 liters × $25 = $34,375
W3 = 375 liters × $30 = $11,250

Diff: 2
Terms: sales value at splitoff method
Objective: 3
AACSB: Analytical skills
30) Cola Drink Company processes direct materials up to the splitoff point where two products, A and B, are obtained. The following information was collected for the month of July:

Direct materials processed: 2,500 liters (with 20% shrinkage)

Production:
- A: 1,500 liters
- B: 500 liters

Sales:
- A: $15.00 per liter
- B: $10.00 per liter

The cost of purchasing 2,500 liters of direct materials and processing it up to the splitoff point to yield a total of 2,000 liters of good products was $4,500. There were no inventory balances of A and B.

Product A may be processed further to yield 1,375 liters of Product Z5 for an additional processing cost of $150. Product Z5 is sold for $25.00 per liter. There was no beginning inventory and ending inventory was 125 liters.

Product B may be processed further to yield 375 liters of Product W3 for an additional processing cost of $275. Product W3 is sold for $30.00 per liter. There was no beginning inventory and ending inventory was 25 liters.

What is Product Z5's estimated net realizable value at the splitoff point?
A) $11,100
B) $22,350
C) $34,225
D) $34,375
Answer: C
Explanation: C) 1,375 × $25 = $34,375; $34,375 - $150 = $34,225
Diff: 3
Terms: net-realizable value (NRV) method
Objective: 3
AACSB: Analytical skills

31) Which of the following is a DISADVANTAGE of the physical-measure method of allocating joint costs?
A) The measurement basis for each product may be different.
B) The need for a common denominator.
C) The physical measure may not reflect the product's ability to generate revenues.
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: physical-measure method
Objective: 3
AACSB: Reflective thinking
32) Which of the methods of allocating joint costs usually is considered the simplest to implement?
   A) estimated net realizable value
   B) constant gross-margin percentage NRV
   C) sales value at splitoff
   D) All of these answers are correct.
   Answer:  C

33) Industries that recognize income on each product when production is completed include:
   A) mining
   B) toy manufacturers
   C) canning
   D) Both A and C are correct.
   Answer:  D

34) Why do accountants criticize the practice of carrying inventories at estimated net realizable values?
   A) The costs of producing the products are usually estimates.
   B) There is usually no clearly defined realizable value for these inventories.
   C) The effect of this practice is to recognize income before sales are made.
   D) All of these answers are correct.
   Answer:  C

35) The constant gross-margin percentage NRV method of joint cost allocation:
   A) involves allocating costs in such a way that maintaining the same gross margin percentage for each product that was obtained in prior years
   B) involves allocating costs in such a way that the overall gross margin percentage is identical for the individual products
   C) is the same as the estimated NRV method
   D) is the same as the sales-value at splitoff method
   Answer:  B
36) The sales value at splitoff method is an example of allocating costs using physical measures.  
Answer: FALSE  
Explanation: The sales value at splitoff method is an example of allocating costs using market based data.  
Diff: 2  
Terms: sales value at splitoff method  
Objective: 3  
AACSB: Reflective thinking

37) The sales value at splitoff method enables the accountant to obtain individual product costs and gross margins.  
Answer: TRUE  
Explanation: The sales value at splitoff method enables the accountant to obtain individual product costs and gross margins.  
Diff: 2  
Terms: sales value at splitoff method  
Objective: 3  
AACSB: Reflective thinking

38) An advantage of the physical-measure method is that obtaining physical measures for all products is an easy task.  
Answer: FALSE  
Explanation: For some products such as gas, obtaining physical measures is difficult.  
Diff: 2  
Terms: physical-measure method  
Objective: 3  
AACSB: Reflective thinking

39) The sales value at splitoff method allocates joint costs to joint products produced during the accounting period on the basis of the relative total sales value at the splitoff point.  
Answer: TRUE  
Diff: 1  
Terms: physical-measure method, joint products, main products  
Objective: 3  
AACSB: Reflective thinking

40) The estimated net realizable value method is used when the market selling prices at the splitoff point are NOT available.  
Answer: TRUE  
Diff: 2  
Terms: net-realizable value (NRV) method  
Objective: 3  
AACSB: Reflective thinking
41) The net realizable value (NRV) method allocates joint costs to joint products produced during the accounting period on the basis of their relative NRV—final sales value plus separable costs.
   Answer: FALSE
   Explanation: The net realizable value (NRV) method allocates joint costs to joint products produced during the accounting period on the basis of their relative NRV—final sales value minus separable costs.
   Diff: 2
   Terms: net-realizable value (NRV) method
   Objective: 3
   AACSB: Reflective thinking

42) The net realizable value method is generally used for products or services that are processed and after splitoff additional value is added to the product and a selling price can be determined.
   Answer: TRUE
   Diff: 2
   Terms: net-realizable value (NRV) method, splitoff point
   Objective: 3
   AACSB: Reflective thinking

43) The constant gross-margin percentage NRV method allocates joint costs to joint products produced during the accounting period in such a way that each individual product achieves an identical gross-margin percentage.
   Answer: TRUE
   Diff: 2
   Terms: constant gross-margin percent NRV, joint costs, splitoff point NRV method
   Objective: 3
   AACSB: Reflective thinking

44) The constant gross-margin percentage method differs from market-based joint-cost allocation method (sales value at splitoff and estimated net realizable value) since no account is taken of profits earned before or after the splitoff point when allocating joint costs.
   Answer: FALSE
   Explanation: The constant gross-margin percentage method takes account of the profits earned before or after the splitoff when allocating joint costs.
   Diff: 2
   Terms: constant gross-margin percent NRV, joint costs, splitoff point NRV method
   Objective: 3
   AACSB: Reflective thinking

45) The sales value at splitoff method presupposes the exact number of subsequent steps undertaken for further processing.
   Answer: FALSE
   Explanation: The sales value at splitoff method does not presuppose the exact number of subsequent steps.
   Diff: 2
   Terms: sales value at splitoff method
   Objective: 3
   AACSB: Reflective thinking
46) A criticism of the practice of carrying inventories at estimated net realizable values is that this practice recognizes income before sales are made.
Answer: TRUE
Diff: 2
Terms: net-realizable value (NRV) method
Objective: 3
AACSB: Reflective thinking

47) The only allowable method of joint cost allocation is specified by FASB.
Answer: FALSE
Explanation: The FASB does not specify a single allowable method of joint cost allocation.
Diff: 2
Terms: byproducts, joint products
Objective: 3
AACSB: Reflective thinking

48) The constant gross-margin percentage NRV method is the only method of allocating joint costs under which products may receive negative allocations.
Answer: TRUE
Diff: 1
Terms: constant gross-margin percent NRV, joint costs, splitoff point NRV method
Objective: 3
AACSB: Reflective thinking

49) The sales-value at splitoff method of joint cost allocation involves computation of the relative amounts of the sales value of the amount of each joint product sold during the period.
Answer: TRUE
Diff: 1
Terms: sales value at splitoff method, joint costs
Objective: 3
AACSB: Reflective thinking

50) The constant gross-margin percentage NRV method allocates joint costs to joint products in such a way that the gross margin on each joint product is the same as it was in the previous year.
Answer: FALSE
Explanation: The constant gross-margin percentage NRV method allocates joint costs to joint products in such a way that the overall gross margin percentage is identical for the individual products.
Diff: 2
Terms: constant gross-margin percentage NRV method, joint products
Objective: 3
AACSB: Reflective thinking
51) For each of the following methods of allocating joint costs, give a positive or a negative aspect of selecting each one to allocate joint costs.

a. sales value at splitoff
b. estimated net realizable value method
c. the constant gross margin method
d. a physical measure such as volume

Answer:

a. Positive: Costs are allocated to products in proportion to their potential revenues. This is a fairly simple method to implement.
   Negative: We use the sales value of the entire production of the accounting period.

b. Positive: It can be used when the market prices of the products are not known or available.
   Negative: It can be very complex in operations with multiple products and multiple splitoff points.

c. Positive: Account is taken of the profits earned either before or after the splitoff point when allocating the joint costs.
   Negative: The assumption is made that all have the same ratio of cost to sales value. This is likely not true.

d. Positive: It is fairly simple to use.
   Negative: It has no relationship to the revenue-producing power of individual products.

Diff: 2
Terms: sales value at splitoff, NRV, const gross-margin % NRV, phys-measure method
Objective: 3
AACSB: Analytical skills

52) Sugar Cane Company processes sugar cane into three products. During May, the joint costs of processing were $240,000. Production and sales value information for the month were as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>Units Produced</th>
<th>Sales Value at Splitoff Point</th>
<th>Separable costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar</td>
<td>6,000</td>
<td>$80,000</td>
<td>$24,000</td>
</tr>
<tr>
<td>Sugar Syrup</td>
<td>4,000</td>
<td>70,000</td>
<td>64,000</td>
</tr>
<tr>
<td>Fructose Syrup</td>
<td>2,000</td>
<td>50,000</td>
<td>32,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$200,000</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Required:**
Determine the amount of joint cost allocated to each product if the sales value at splitoff method is used.

Answer:

<table>
<thead>
<tr>
<th>Product</th>
<th>Units</th>
<th>Sales Value</th>
<th>Percent</th>
<th>Joint Cost</th>
<th>Allocated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar</td>
<td>6,000</td>
<td>$80,000</td>
<td>40%</td>
<td>$240,000</td>
<td>$96,000</td>
</tr>
<tr>
<td>Sugar Syrup</td>
<td>4,000</td>
<td>70,000</td>
<td>35%</td>
<td>240,000</td>
<td>84,000</td>
</tr>
<tr>
<td>Fructose Syrup</td>
<td>2,000</td>
<td>50,000</td>
<td>25%</td>
<td>240,000</td>
<td>60,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$200,000</strong></td>
<td>100%</td>
<td><strong>$240,000</strong></td>
<td></td>
</tr>
</tbody>
</table>
53) Calamata Corporation processes a single material into three separate products A, B, and C. During September, the joint costs of processing were $300,000. Production and sales value information for the month were as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>Units Produced</th>
<th>Final Sales Value per Unit</th>
<th>Separable Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>10,000</td>
<td>$25</td>
<td>$125,000</td>
</tr>
<tr>
<td>B</td>
<td>15,000</td>
<td>30</td>
<td>250,000</td>
</tr>
<tr>
<td>C</td>
<td>12,500</td>
<td>24</td>
<td>125,000</td>
</tr>
</tbody>
</table>

**Required:**
Determine the amount of joint cost allocated to each product if the constant gross-margin percentage NRV method is used.

**Answer:** The gross margin percentage is 20%  \( \frac{(1,000,000-800,000)}{1,000,000} \)

<table>
<thead>
<tr>
<th>Product</th>
<th>Final Sales Value</th>
<th>Less Gross Margin</th>
<th>Total Production Costs</th>
<th>Less Separable Costs</th>
<th>Joint Costs Allocated</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$ 250,000</td>
<td>$50,000</td>
<td>$200,000</td>
<td>$125,000</td>
<td>$ 75,000</td>
</tr>
<tr>
<td>B</td>
<td>450,000</td>
<td>90,000</td>
<td>360,000</td>
<td>250,000</td>
<td>110,000</td>
</tr>
<tr>
<td>C</td>
<td>300,000</td>
<td>60,000</td>
<td>240,000</td>
<td>125,000</td>
<td>115,000</td>
</tr>
<tr>
<td>Total</td>
<td>1,000,000</td>
<td>200,000</td>
<td>800,000</td>
<td>$500,000</td>
<td>300,000</td>
</tr>
</tbody>
</table>

Diff: 2
Terms: constant gross-margin percentage NRV method, joint products
Objective: 3
AACSB: Analytical skills
54) Oregon Lumber processes timber into four products. During January, the joint costs of processing were $280,000. There was no inventory at the beginning of the month. Production and sales value information for the month is as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>Board feet</th>
<th>Sales Value at Splitoff Point</th>
<th>Ending Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 x 4's</td>
<td>6,000,000</td>
<td>$0.30 per board foot</td>
<td>500,000 bdft.</td>
</tr>
<tr>
<td>2 x 6's</td>
<td>3,000,000</td>
<td>0.40 per board foot</td>
<td>250,000 bdft.</td>
</tr>
<tr>
<td>4 x 4's</td>
<td>2,000,000</td>
<td>0.45 per board foot</td>
<td>100,000 bdft.</td>
</tr>
<tr>
<td>Slabs</td>
<td>1,000,000</td>
<td>0.10 per board foot</td>
<td>50,000 bdft.</td>
</tr>
</tbody>
</table>

**Required:**
Determine the value of ending inventory if the sales value at splitoff method is used for product costing. Round to 3 decimal places when necessary.

**Answer:**

<table>
<thead>
<tr>
<th>Product</th>
<th>Board feet</th>
<th>Sales Value</th>
<th>Percent</th>
<th>Joint Cost</th>
<th>Allocated</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 x 4's</td>
<td>6,000,000</td>
<td>$1,800,000</td>
<td>45.0</td>
<td>$280,000</td>
<td>$126,000</td>
</tr>
<tr>
<td>2 x 6's</td>
<td>3,000,000</td>
<td>1,200,000</td>
<td>30.0</td>
<td>280,000</td>
<td>84,000</td>
</tr>
<tr>
<td>4 x 4's</td>
<td>2,000,000</td>
<td>900,000</td>
<td>22.5</td>
<td>280,000</td>
<td>63,000</td>
</tr>
<tr>
<td>Slabs</td>
<td>1,000,000</td>
<td>100,000</td>
<td>2.5</td>
<td>280,000</td>
<td>7,000</td>
</tr>
<tr>
<td>Totals</td>
<td>$4,000,000</td>
<td>100.0%</td>
<td></td>
<td>$280,000</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product</th>
<th>Fraction of Production in Inventory</th>
<th>Allocated</th>
<th>Inventory value</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 x 4's</td>
<td>500,000/6,000,000 × $126,000</td>
<td>$10,500</td>
<td></td>
</tr>
<tr>
<td>2 x 6's</td>
<td>250,000/3,000,000 × 84,000</td>
<td>7,000</td>
<td></td>
</tr>
<tr>
<td>4 x 4's</td>
<td>100,000/2,000,000 × 63,000</td>
<td>3,150</td>
<td></td>
</tr>
<tr>
<td>Slabs</td>
<td>50,000/1,000,000 × 7,000</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>$21,000</td>
<td></td>
</tr>
</tbody>
</table>

**Diff:** 3
**Terms:** sales value at splitoff method
**Objective:** 3
**AACSB:** Analytical skills
55) Zenon Chemical, Inc., processes pine rosin into three products: turpentine, paint thinner, and spot remover. During May, the joint costs of processing were $240,000. Production and sales value information for the month is as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>Units Produced</th>
<th>Sales Value at Splitoff Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turpentine</td>
<td>6,000 liters</td>
<td>$60,000</td>
</tr>
<tr>
<td>Paint thinner</td>
<td>6,000 liters</td>
<td>50,000</td>
</tr>
<tr>
<td>Spot remover</td>
<td>3,000 liters</td>
<td>25,000</td>
</tr>
</tbody>
</table>

**Required:**
Determine the amount of joint cost allocated to each product if the physical-measure method is used.

**Answer:**

<table>
<thead>
<tr>
<th>Product</th>
<th>Units Produced</th>
<th>Percentage</th>
<th>Joint Costs</th>
<th>Allocated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turpentine</td>
<td>6,000 liters</td>
<td>40 ×</td>
<td>$240,000 =</td>
<td>$96,000</td>
</tr>
<tr>
<td>Paint thinner</td>
<td>6,000 liters</td>
<td>40 ×</td>
<td>240,000 =</td>
<td>96,000</td>
</tr>
<tr>
<td>Spot remover</td>
<td>3,000 liters</td>
<td>20 ×</td>
<td>240,000 =</td>
<td>48,000</td>
</tr>
<tr>
<td>Totals</td>
<td>15,000</td>
<td>100</td>
<td>$240,000</td>
<td>$240,000</td>
</tr>
</tbody>
</table>

Diff: 2  
Terms: physical-measure method  
Objective: 3  
AACSB: Analytical skills
56) Red Sauce Canning Company processes tomatoes into catsup, tomato juice, and canned tomatoes. During the summer of 20X5, the joint costs of processing the tomatoes were $420,000. There was no beginning or ending inventories for the summer. Production and sales value information for the summer is as follows:

<table>
<thead>
<tr>
<th>Product</th>
<th>Cases</th>
<th>Sales Value at Splitoff Point</th>
<th>Separable Costs</th>
<th>Selling Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catsup</td>
<td>100,000</td>
<td>$6 per case</td>
<td>$3.00 per case</td>
<td>$28 per case</td>
</tr>
<tr>
<td>Juice</td>
<td>150,000</td>
<td>8 per case</td>
<td>5.00 per case</td>
<td>25 per case</td>
</tr>
<tr>
<td>Canned</td>
<td>200,000</td>
<td>5 per case</td>
<td>2.50 per case</td>
<td>10 per case</td>
</tr>
</tbody>
</table>

**Required:**
Determine the amount allocated to each product if the estimated net realizable value method is used, and compute the cost per case for each product.

**Answer:**

<table>
<thead>
<tr>
<th>Product</th>
<th>Expected Sales Value</th>
<th>Separable Costs</th>
<th>Net Realizable Value</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catsup</td>
<td>$2,800,000</td>
<td>$300,000</td>
<td>$2,500,000</td>
<td>35.71</td>
</tr>
<tr>
<td>Juice</td>
<td>3,750,000</td>
<td>750,000</td>
<td>3,000,000</td>
<td>42.86</td>
</tr>
<tr>
<td>Canned</td>
<td>2,000,000</td>
<td>500,000</td>
<td>1,500,000</td>
<td>21.43</td>
</tr>
<tr>
<td>Totals</td>
<td>$7,000,000</td>
<td>$1,550,000</td>
<td>$5,450,000</td>
<td>100.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product</th>
<th>Percentage</th>
<th>Joint Costs Allocated</th>
<th>Separable Costs</th>
<th>Product Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catsup</td>
<td>35.71%</td>
<td>$420,000 × $149,982</td>
<td>$300,000 =</td>
<td>$449,982</td>
</tr>
<tr>
<td>Juice</td>
<td>42.86%</td>
<td>420,000 × 180,012</td>
<td>750,000 =</td>
<td>930,012</td>
</tr>
<tr>
<td>Canned</td>
<td>21.43%</td>
<td>420,000 × 90,006</td>
<td>500,000 =</td>
<td>590,006</td>
</tr>
</tbody>
</table>

Catsup cost per case  = $449,982/100,000 = $4.50
Juice cost per case  = $930,012/150,000 = $6.20
Canned cost per case = $590,006/200,000 = $2.95

Diff: 3

Terms: net-realizable value (NRV) method

Objective: 3

AACSB: Analytical skills
57) Pilgrim Corporation processes frozen turkeys. The company has not been pleased with its profit margin per product because it appears that the high value items have too few costs assigned to them, while the low value items have too many costs assigned to them. The processing results in several products, the primary one of which is frozen small turkeys. Other products include frozen parts such as wings and legs, byproducts such as skin and bones, and unused scrap items.

**Required:**
What may be the cost assignment problem if a key consideration is the value of the products being sold?

Answer: First, the company needs to consider whether the byproducts are being treated as products, rather than byproducts. For the most part, byproducts should not be assigned costs. The revenue from the byproducts should be used as either minor sale categories or else as offsets to processing costs.

A second consideration is the method used to assign the costs. It is possible that some physical measure (weight) is being used, in which case the parts items and the byproducts may weigh as much as the primary product. It may be necessary to evaluate the various methods of allocation and select the one which management feels is best for decision making.

**Diff:** 2

**Terms:** joint costs, sales value at splitoff method, physical-measure method

**Objective:** 3

**AACSB:** Analytical skills

58) Wharf Fisheries processes many of its seafood items to the demands of its largest customers, most of which are large retail distributors. To keep the accounting system simple, it has always assigned cost by the weight of the finished product. However, with increased competition, it has had to watch its prices closely and, in recent years, several items have incurred zero profit margins. After several weeks of investigation, your consulting firm has found that, while weight is important in processing of seafood, numerous items have very distinct processing steps and some items are processed through more steps than others.

**Required:**
Based on the findings of your consulting firm, what changes might you recommend to the company in the way of cost allocation among its products?

Answer: Recommendations might include, among others, some of the following:

a. Categorize the fishing expeditions as joint costs, especially if multiple items are caught.
b. Categorize all processing activities where multiple items are processed as joint costs.
c. For those processes that are unique to only one product or a set of products, use separable cost categories.
d. Choose something other than weight for allocating joint costs. Select one of the value methods of assigning the costs.
e. Carefully separate main products from byproducts in the costing system.
f. Do not allocate the joint costs for internal decisions.

**Diff:** 2

**Terms:** joint costs, physical-measure method, sales value at splitoff method

**Objective:** 3

**AACSB:** Analytical skills
59) Paragon University operates an extensive and an expensive registration, testing, and counseling center, through which all students are required to pass through when they enter the university. The registration effort's costs (for the most part) are almost impossible to allocate based upon which students require time, effort, etc. The cost of this center is approximately 15% of the total costs of Paragon. This department engages in no other activities than the registration of students. Paragon is interested in determining the profitability of the three technical departments it operates. Paragon has the perception that some departments are more profitable than others, and it would like to determine an appropriate method of allocating the costs of this registration center.

**Required:**
Recommend to Paragon University a method (or methods) of allocating the costs of registration to the three departments.

**Answer:** The joint costs of the registration effort could be allocated based on physical volume or the sales (tuition) dollars of each department.

**Volume.** Allocating on volume would be based not upon physical measures, but upon the number of credit hours each of the three departments offer each semester. If the ratio of credit hours for the three departments were 25%, 45%, and 30% then the costs would be allocated based upon these ratios.

**Sales Dollars.** It is possible that some departments charge more per credit hour than others. In this case it might be appropriate to allocate the costs based upon the total tuition revenues of each department.

**Terms:** joint costs, physical-measure method, sales value at splitoff method

**Objective:** 3

**AACSB:** Reflective thinking

**Objective 16.4**

1) Which of the following is NOT a reason to use the sales value at splitoff method:
A) simplicity
B) no anticipation of subsequent management decisions
C) measurement of the value of the joint products at the splitoff point
D) All of the above are reasons to use the sales value at splitoff method.

**Answer:** D

**Terms:** sales value at splitoff method

**Objective:** 4

**AACSB:** Reflective thinking

2) Which method of allocating costs would be used if the selling prices of all products at the splitoff point are UNAVAILABLE?
A) sales value at splitoff method
B) NRV method
C) physical measures method
D) constant gross-margin percentage method

**Answer:** C

**Terms:** net-realizable value (NRV) method

**Objective:** 4

**AACSB:** Reflective thinking
3) What is the reason that accountants do NOT like to carry inventory at net realizable value?
A) NRV is the most difficult costing method
B) NRV recognizes income after the sale is complete
C) NRV recognizes income before sales are made
D) NRV is acceptable to the taxing authorities
Answer: C
Diff: 2
Terms: net-realizable value (NRV) method
Objective: 4
AACSB: Reflective thinking

4) The sales value at splitoff method is preferable when selling-price data exists at splitoff.
Answer: TRUE
Diff: 2
Terms: sales value at splitoff method
Objective: 4
AACSB: Reflective thinking

5) Physical measures such as weight or volume are the best indicator of the benefits received for allocating joint costs.
Answer: FALSE
Explanation: Revenues are a better indicator of the benefits received than are physical measures.
Diff: 2
Terms: physical-measure method
Objective: 4
AACSB: Reflective thinking

6) The constant gross-margin percentage NRV method makes the simplifying assumption of treating the joint products as though they comprise a single product.
Answer: TRUE
Diff: 2
Terms: constant gross-margin percentage NRV method, joint products
Objective: 4
AACSB: Reflective thinking
7) List the reasons that the sales value at splitoff method of joint cost allocation should be used.
Answer:
1. Measurement of the value of the joint products at splitoff - Sales value at splitoff is the best measure of the benefits received as a result of joint processing.
2. No anticipation of subsequent management decisions - This method does not require information on processing steps after splitoff.
3. Availability of a common basis to allocate joint costs to products - Revenue is the common basis to allocate costs.
4. Simplicity - It is the simplest method compared to the NRV and constant gross-margin percentage NRV methods.
Diff: 3
Terms: sales value at splitoff method
Objective: 4
AACSB: Reflective thinking

8) What are the four methods of allocating joint costs to individual products? Which of these methods is preferred, and what are two advantages of this method?
Answer: The four methods of allocating joint costs to individual products are: the sales-value at splitoff method, estimated net-realizable value (NRV) method, the constant gross margin percentage NRV, and physical measures methods.
Of these methods, the sales-value at splitoff method is preferred when market prices are available, because it is consistent with the benefits-received criterion, it does not depend or anticipate further managerial decisions on further processing, and it is relatively simple.
Diff: 2
Terms: joint costs, sales-val at splitoff, est NRV, const gross margin % NRV, phys meas method
Objective: 3, 4
AACSB: Reflective thinking

Objective 16.5

1) When a product is the result of a joint process, the decision to process the product past the splitoff point further should be influenced by the:
A) total amount of the joint costs
B) portion of the joint costs allocated to the individual products
C) extra revenue earned past the splitoff point
D) extra operating income earned past the splitoff point
Answer: D
Diff: 1
Terms: joint products
Objective: 5
AACSB: Reflective thinking
2) Which cost allocation method should NOT be used to eliminate the conflict between decision making and performance evaluation?
A) sales value at splitoff
B) NRV
C) physical measures
D) constant gross-margin percentage NRV
Answer: C
Diff: 1
Terms: jnt costs, constant gross-margin % NRV, NRV, and sales value at splitoff method
Objective: 5
AACSB: Reflective thinking

3) If managers make decisions to sell or process further using an incremental revenue/incremental cost approach, which method will show each product budgeted to have a positive (or zero) operating income on the resulting budgeted product-line income statement?
A) sales value at splitoff
B) estimated NRV
C) constant gross-margin percentage NRV
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: joint products
Objective: 5
AACSB: Reflective thinking

4) What factor most often drives joint cost allocation?
A) performance evaluation
B) manager compensation
C) selling prices
D) simplicity of the method
Answer: C
Diff: 2
Terms: cost allocation
Objective: 5
AACSB: Reflective thinking

5) Joint costs that do NOT differ between alternatives are particularly relevant for decision making.
Answer: FALSE
Explanation: Only costs that differ are relevant to a manager's decision.
Diff: 2
Terms: joint costs
Objective: 5
AACSB: Reflective thinking
6) Joint processing costs are always relevant for pricing decisions of the final product.
Answer: FALSE
Explanation: Joint processing costs that do not differ between alternatives are not relevant for pricing decisions of the final product.
Diff: 2
Terms: joint products
Objective: 5
AACSB: Reflective thinking

7) All separable costs in joint-cost allocations are always incremental costs.
Answer: FALSE
Explanation: Some of the separable costs may be fixed and therefore not incremental.
Diff: 2
Terms: joint products
Objective: 5
AACSB: Reflective thinking

8) New York Liberty Corporation makes miniature statues of the Empire State Building from cast iron. Sales total 50,000 units a year. The statues are finished either rough or polished, with an average demand of 60% rough and 40% polished. Iron ingots, the direct material, costs $6 per pound. Processing costs are $300 to convert 30 pounds into 60 statues. Rough statues are sold for $15 each, and polished statues can be sold for $18 or engraved for an additional cost of $5. Polished statues can then be sold for $30.

**Required:**
Determine whether New York Liberty Company should sell the engraved statues. Why?
Answer: New York Liberty should engrave the statues because they increase profits by $7 per statute.

<table>
<thead>
<tr>
<th></th>
<th>Rough</th>
<th>Polished</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$15.00</td>
<td>$18.00</td>
</tr>
<tr>
<td>Cost of Sales:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Materials ($6 × 30)/60</td>
<td>$3.00</td>
<td>$3.00</td>
</tr>
<tr>
<td>Conversion $300/60</td>
<td>5.00</td>
<td>8.00</td>
</tr>
<tr>
<td>Operating Income (loss)</td>
<td>$7.00</td>
<td>$10.00</td>
</tr>
</tbody>
</table>

|                  | Rough  | Polished |
| Sales, polished and engraved |        | $30.00   |
| Costs:            |        |          |
| Materials         | $3.00  |          |
| Conversion        | 5.00   |          |
| Additional Processing | 5.00  | 13.00   |
| Operating Income (loss) |        | $17.00 |
| Advantage in favor of selling the engraved statues |        | $7.00   |

Diff: 1
Terms: joint products
Objective: 5
AACSB: Analytical skills
9) What revenue or expense amounts are necessary to make a sell-or-process-further decision and why? What items are irrelevant to the decision and why?
Answer: The revenues and expenses that occur after splitoff are the necessary items to make a sell-or-process-further decision. If incremental revenues are higher than incremental costs, processing further is the correct decision. Expenses that occur before the splitoff point, called joint processing costs, are irrelevant to the decision. These expenses have occurred and have no effect on the decision to sell-or-process-further.
Diff: 2
Terms: sell or process further
Objective: 5
AACSB: Reflective thinking

Objective 16.6

1) Which method of accounting recognizes byproducts in the financial statements at the time their production is completed?
A) production allocation method
B) sale method
C) production method
D) None of these answers is correct.
Answer: C
Diff: 2
Terms: byproducts
Objective: 6
AACSB: Reflective thinking
Answer the following questions using the information below:

Athens Company processes 15,000 gallons of direct materials to produce two products, Product X and Product Y. Product X sells for $8 per gallon and Product Y, the main product, sells for $100 per gallon. The following information is for August:

<table>
<thead>
<tr>
<th></th>
<th>Production</th>
<th>Sales</th>
<th>Beginning Inventory</th>
<th>Ending Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product X</td>
<td>4,375</td>
<td>4,000</td>
<td>0</td>
<td>375</td>
</tr>
<tr>
<td>Product Y</td>
<td>10,000</td>
<td>9,625</td>
<td>125</td>
<td>500</td>
</tr>
</tbody>
</table>

The manufacturing costs totaled $30,000.

2) What is the byproduct's net revenue reduction if byproducts are recognized in the general ledger during production and their revenues are a reduction of cost?
   A) $0
   B) $3,000
   C) $32,000
   D) $35,000
   Answer: C
   Explanation: C) 4,000 gallons × $8 = $32,000
   Diff: 3
   Terms: byproducts
   Objective: 6
   AACSB: Analytical skills

3) How much is the ending inventory reduction for the byproduct if byproducts are recognized in the general ledger at the point of sale?
   A) $0
   B) $563
   C) $1,500
   D) $17,500
   Answer: A
   Diff: 2
   Terms: byproducts
   Objective: 6
   AACSB: Analytical skills

4) A negative consequence of recording byproducts in the accounting records when the sale occurs is that:
   A) the revenue from the byproducts is usually fairly large, and the accounting records will be distorted
   B) managers can time earnings by their decision when to sell byproducts
   C) managers have an incentive to stockpile byproducts
   D) Both B and C are correct.
   Answer: D
   Diff: 1
   Terms: byproducts
   Objective: 6
   AACSB: Reflective thinking
5) Which statement is NOT true regarding the sales method of accounting for byproducts.
A) the method makes no journal entries until the byproduct is sold
B) this method is the preferred method because of the matching principle
C) revenues of the byproduct can be recorded in the income statement as revenue
D) revenues of the byproduct can be recorded as a reduction of cost of goods sold in the income statement
Answer:  B
Diff:  1
Terms:  byproducts
Objective:  6
AACSB:  Reflective thinking

6) Byproducts are recognized in the general ledger either at the time production is completed or at the time of sale.
Answer:  TRUE
Diff:  2
Terms:  byproducts
Objective:  6
AACSB:  Reflective thinking

7) The production method for recognizing byproducts is conceptually correct in that it is consistent with the matching principle.
Answer:  TRUE
Explanation: The production method for recognizing byproducts is conceptually correct in that it is consistent with the matching principle.
Diff:  2
Terms:  byproducts
Objective:  6
AACSB:  Reflective thinking

8) A sound reason for reporting revenue from byproducts as an income statement item at the time of sale is to lessen the chance of managers managing reported earnings.
Answer:  FALSE
Explanation: This method makes it easier for managers to time earnings since they can time the sale of products and give earnings a boost.
Diff:  2
Terms:  byproducts
Objective:  6
AACSB:  Reflective thinking

9) A byproduct is one or more products of a joint production process that have low total sales value compared to the total sales value of the main product or joint products.
Answer:  TRUE
Diff:  1
Terms:  byproducts
Objective:  6
AACSB:  Reflective thinking
10) The Carolina Company prepares lumber for companies who manufacture furniture. The main product is finished lumber with a byproduct of wood shavings. The byproduct is sold to plywood manufacturers. For July, the manufacturing process incurred $332,000 in total costs. Eighty thousand board feet of lumber were produced and sold along with 6,800 pounds of shavings. The finished lumber sold for $6.00 per board foot and the shavings sold for $0.60 a pound. There were no beginning or ending inventories.

**Required:**
Prepare an income statement showing the byproduct (1) as a cost reduction during production, and (2) as a revenue item when sold.

<table>
<thead>
<tr>
<th>Answer:</th>
<th>Cost reduction when produced</th>
<th>Revenue when sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales: Lumber Shavings</td>
<td>$480,000</td>
<td>$480,000</td>
</tr>
<tr>
<td>Total Sales:</td>
<td></td>
<td>480,000</td>
</tr>
<tr>
<td>Cost of Good Sold:</td>
<td></td>
<td>484,080</td>
</tr>
<tr>
<td>Total manufacturing costs</td>
<td>$332,000</td>
<td>$332,000</td>
</tr>
<tr>
<td>Byproduct</td>
<td>4,080</td>
<td>0</td>
</tr>
<tr>
<td>Total COGS</td>
<td>327,920</td>
<td>332,000</td>
</tr>
<tr>
<td>Gross Margin</td>
<td>$152,080</td>
<td>$152,080</td>
</tr>
</tbody>
</table>

**Answer:**

<table>
<thead>
<tr>
<th>Sales: Lumber Shavings</th>
<th>Cost reduction when produced</th>
<th>Revenue when sold</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales: Lumber Shavings</td>
<td>$480,000</td>
<td>$480,000</td>
</tr>
<tr>
<td>Total Sales:</td>
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</tr>
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<td>4,080</td>
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</tr>
<tr>
<td>Gross Margin</td>
<td>$152,080</td>
<td>$152,080</td>
</tr>
</tbody>
</table>

**Diff: 2**  
Terms: byproducts  
Objective: 6  
AACSB: Analytical skills

11) Distinguish between the two principal methods of accounting for byproducts, the production byproduct method and the sale byproduct method. Briefly discuss the relative merits (or lack thereof) of each.

**Answer:**

a. **Production byproduct method.**
This method recognizes byproducts in the financial statements at the time their production is completed. The estimated net realizable value from the byproduct produced is offset against the costs of the main (or joint) products, and it is reported in the balance sheet as inventory. Accounting entries are made and the byproducts are reported in the balance sheet at their selling price.

b. **Sale byproduct method.**
This method delays recognition of the byproducts until the time of their sale. Revenues could be recorded in one accounting period, while the expense in an earlier period. Companies may find it necessary to keep an inventory of the byproduct processing costs in a separate account until the byproducts are sold. This practice can be rationalized on the grounds that the dollar amounts of byproducts are immaterial. But managers can use this method to manage reported earnings by timing when they sell byproducts.

**Diff: 2**  
Terms: byproducts  
Objective: 6  
AACSB: Reflective thinking
12) What are the two methods to account for byproducts. Which is the more appropriate method to use and why?

Answer: The two methods are the production method and the sales method. The production method recognizes byproducts in the financial statements at the time production is completed. The sales method delays recognition of byproducts until the time of sale. The production method is the appropriate method to use because it is consistent with the matching principle. If the sales method were used, the byproduct cost recognition could be delayed for several periods until the inventory is sold.

Diff: 2
Terms: byproducts
Objective: 6
AACSB: Reflective thinking

Objective 16.7

1) The production method of accounting for byproducts recognizes byproducts in the financial statements at the time when production is completed.

Answer: TRUE
Diff: 2
Terms: byproducts
Objective: 7
AACSB: Reflective thinking
Objective 17.1

1) Costing systems that are used for the costing of like or similar units of products in mass production are called:
   A) inventory-costing systems
   B) job-costing systems
   C) process-costing systems
   D) weighted-average costing systems
   Answer: C
   Diff: 1
   Terms: process-costing system
   Objective: 1
   AACSB: Reflective thinking

2) Which of the following manufactured products would NOT use process costing?
   A) 747 jet aircraft
   B) 46-inch television sets
   C) Construction of a commercial office building
   D) Both A and C are correct.
   Answer: D
   Diff: 2
   Terms: process-costing system
   Objective: 1
   AACSB: Reflective thinking

3) Process costing should be used to assign costs to products when the:
   A) units produced are similar
   B) units produced are dissimilar
   C) calculation of unit costs requires the averaging of unit costs over all units produced
   D) Either A or C are correct.
   Answer: D
   Diff: 2
   Terms: process-costing system
   Objective: 1
   AACSB: Reflective thinking

4) Which one of the following statements is true?
   A) In a job-costing system, individual jobs use different quantities of production resources.
   B) In a process-costing system each unit uses approximately the same amount of resources.
   C) An averaging process is used to calculate unit costs in a job-costing system.
   D) Both A and B are correct.
   Answer: D
   Diff: 2
   Terms: process-costing system
   Objective: 1
   AACSB: Reflective thinking
5) Conversion costs:
A) include all the factors of production
B) include direct labor and overhead
C) in process costing are usually considered to be added evenly throughout the production process
D) Both B and C are correct.
Answer: D
Diff: 2
Terms: process-costing system
Objective: 1
AACSB: Reflective thinking

6) An example of a business which would have no beginning or ending inventory but which could use process costing to compute unit costs would be a:
A) clothing manufacturer
B) corporation whose sole business activity is processing the customer deposits of several banks
C) manufacturer of custom houses
D) manufacturer of large TVs
Answer: B
Diff: 2
Terms: process-costing system
Objective: 1
AACSB: Reflective thinking

7) Which of the following statement(s) concerning conversion costs is correct?
A) Estimating the degree of completion of direct materials in a partially completed unit is usually easier to calculate than estimating the degree of completion for conversion costs.
B) The calculation of equivalent units is relatively easy for the textile industry.
C) Estimates are usually not considered acceptable.
D) Both B and C are correct.
Answer: A
Diff: 2
Terms: process-costing system, equivalent units
Objective: 1
AACSB: Reflective thinking

8) Examples of industries that would use process costing include the soft-drink bottling and oil industry.
Answer: TRUE
Diff: 1
Terms: process-costing system
Objective: 1
AACSB: Reflective thinking
9) The principal difference between process costing and job costing is that in job costing an averaging process is used to compute the unit costs of products or services.
Answer: FALSE
Explanation: The averaging process is used to calculate unit costs in process costing.
Diff: 2
Terms: process-costing system
Objective: 1
AACSB: Reflective thinking

10) Process-costing systems separate costs into cost categories according to the timing of when costs are introduced into the process.
Answer: TRUE
Diff: 2
Terms: process-costing system
Objective: 1
AACSB: Reflective thinking

11) Estimating the degree of completion for the calculation of equivalent units is usually easier for conversion costs than it is for direct materials.
Answer: FALSE
Explanation: Estimating the degree of completion is easier for the calculation of direct materials since direct materials can be measured more easily than conversion costs.
Diff: 2
Terms: equivalent units
Objective: 1
AACSB: Reflective thinking

12) Job-order costing would be most likely used by a firm that produces homogeneous products.
Answer: FALSE
Explanation: Process costing would be most likely used by a firm that produces homogeneous products.
Diff: 1
Terms: process costing
Objective: 1
AACSB: Reflective thinking

13) When identical or similar units of products or services are mass produced, job-costing is used to calculate an average production cost for all units produced.
Answer: FALSE
Explanation: When identical or similar units of products or services are mass produced, process costing is used to calculate an average production cost for all units produced.
Diff: 1
Terms: process costing
Objective: 1
AACSB: Reflective thinking
14) There are basically two distinct methods of calculating product costs.

**Required:**

Compare and contrast the two methods.
Answer: In job costing the job or product is a distinctly identifiable product or service. Each job requires (or can require) vastly different amounts of input. Job costing is usually associated with products that are unique or heterogeneous. Thus, each job requires different amounts of input, and they can require vastly different amount of costs to finish. Job-costed products tend to be high cost per unit. Thus the costs of each (unique) job are important for planning, pricing, and profitability.

In process costing, the jobs or products are similar (or homogeneous). Each job usually requires the same inputs, and results in approximately the same costs per unit. The cost of a product or service is obtained by assigning total costs to many identical or similar units. We assume each unit receives the same amount of direct material costs, direct manufacturing labor costs, and indirect manufacturing costs. Unit costs are then computed by dividing total costs by the number of units.

The principal difference between process costing and job costing is the extent of averaging used to compute unit costs. As noted above in job costing, individual jobs use different quantities of production resources; whereas in process costing, we assume that each job uses approximately the same amount of resources.

**Diff: 2**

Terms: process-costing system
Objective: 1
AACSB: Reflective thinking

15) Why do we need to accumulate and calculate unit costs in process costing (and also job costing)?

Answer: We need to accumulate unit costs to:
1. Budget (planning)
2. Price
3. Account for the costs

1. **Budgeting**  
   To operate a successful business, we should prepare budgets, review the results, and make decisions as to how well our business is doing. Our business has formulated plans for the future. The resources we need for the future (materials, conversion costs, facilities, etc.) will depend on our estimate of the resources we need to accomplish these goals. An important part of these estimates is the unit costs of the products we plan to produce. These unit costs will tell us how many dollars we must acquire to accomplish our plans.

2. **Price**  
   In order to be a profitable business, we must sell our product at a price in excess of what it costs us to produce the product. Essential for the pricing decision is the cost per unit. We will also learn whether we can sell a product at a profit.

3. **Accounting**  
   During the course of the accounting period, we will be accumulating costs. At the end of the accounting period, we must allocate this pool of costs between the units that were transferred out and the goods in ending inventory. Unit costs are essential for this purpose.

**Diff: 1**

Terms: process-costing system
Objective: 1
AACSB: Reflective thinking
16) The president of the Gulf Coast Refining Corporation wants to know why his golfing partner, who is the chief financial officer of a large construction company, calculates his costs by the job, but his own corporation calculates costs by large units rather than by individual barrel of oil.
Answer: Oil refineries use process costing to calculate their costs per barrel of oil. Each barrel of oil is essentially the same. Thus, costs are accumulated for all the oil processed during a given time period, and the total costs are divided by the barrels of oil produced. An average cost is calculated. Since the costs to actually produce the oil are essentially the same, accuracy is not lost by this process.

The construction company calculates costs by each job, since each job can require substantially different amounts of the various inputs. Thus, the cost of each job could be radically different from the other jobs.
Diff: 1
Terms: process-costing system
Objective: 1
AACSB: Multiculturalism and diversity

17) Describe the differences between process costing and job costing. Discuss some typical products which would be more likely to use process costing as compared to some which would be more likely to use job costing.
Answer: When products are unique, job costing is a more appropriate method to use in collecting costs and making decisions regarding price levels. In a job-costing system, individual jobs require differing levels of resources. Each job is treated separately and the resources used to complete the job have to be calculated separately. Construction jobs are most likely to use job costing because of their unique specifications.

In a process-costing system, the units produced as output are very similar to one another. As a result, the means by which the raw material is converted to a finished product is common among all of the products. This allows the conversion costs to be summed up and divided by the total number of units for an accurate conversion cost on a unit by unit basis. Some typical types of products which are likely to use process costing are oil refineries, ice cream, various food preparation industries, etc. This is because the raw material is processed in a similar manner for all of the units produced.

Diff: 1
Terms: process-costing system
Objective: 1
AACSB: Reflective thinking

Objective 17.2

1) In a process-costing system average unit costs are calculated
A) by dividing total costs in a given accounting period by total units produced in that period.
B) by multiplying total costs in a given accounting period by total units produced in that period.
C) by dividing total costs in a given accounting period by units started in that period.
D) by multiplying total costs in a given accounting period by units started in that period.
Answer: A
Diff: 1
Terms: average unit cost
Objective: 2
AACSB: Reflective thinking
Objective 17.3

1) The purpose of the equivalent-unit computation is to:
A) convert completed units into the amount of partially completed output units that could be made with that quantity of input
B) assist the business in determining the cost assigned to ending inventory and work-in-process inventory.
C) convert partially completed units into the amount of completed output units that could be made with that quantity of input
D) Both B and C are correct.
Answer: D
Diff: 2
Terms: equivalent units
Objective: 3
AACSB: Reflective thinking

2) In a process-costing system, the calculation of equivalent units is used for calculating:
A) the dollar amount of ending inventory
B) the dollar amount of the cost of goods sold for the accounting period
C) the dollar cost of a particular job
D) Both A and B are correct.
Answer: D
Diff: 1
Terms: equivalent units
Objective: 3
AACSB: Reflective thinking

3) When a Bakery transfers goods from the Mixing Department to the Baking Department, the accounting entry is:
A) Work in Process Mixing Department
   Work in Process Baking Department
B) Work in Process Baking Department
   Accounts Payable
C) Work in Process Baking Department
   Work in Process Mixing Department
D) Work in Process Mixing Department
   Accounts Payable
Answer: C
Diff: 2
Terms: process-costing system
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

Dustin Plastics, Inc., manufactures plastic moldings for car seats. Its costing system utilizes two cost categories, direct materials and conversion costs. Each product must pass through Department A and Department B. Direct materials are added at the beginning of production. Conversion costs are allocated evenly throughout production.

**Data for Department A for February 2012 are:**
- Work in process, beginning inventory, 40% converted: 200 units
- Units started during February: 600 units
- Work in process, ending inventory: 100 units

**Costs for Department A for February 2012 are:**
- Work in process, beginning inventory:
  - Direct materials: $200,000
  - Conversion costs: $200,000
- Direct materials costs added during February: $2,000,000
- Conversion costs added during February: $2,500,000

4) What is the unit cost per equivalent unit of beginning inventory in Department A?
A) $2,000
B) $3,500
C) $7,000
D) $7,500
Answer: B
Explanation:
B) Direct materials per unit ($200,000/200 units) $ 1,000
Conversion costs per unit ($200,000/(200 × 0.40) units) 2,500
Total costs per unit $3,500
Diff: 2
Terms: equivalent units
Objective: 3
AACSB: Analytical skills

5) How many units were completed and transferred out of Department A during February?
A) 100 units
B) 600 units
C) 700 units
D) 800 units
Answer: C
Explanation: C) 200 units + 600 units - 100 units = 700 units
Diff: 2
Terms: equivalent units
Objective: 3
AACSB: Analytical skills
6) Dustin Plastics, Inc., manufactures plastic moldings for car seats. Its costing system uses two cost categories, direct materials and conversion costs. Each product must pass through Department A and Department B. Direct materials are added at the beginning of production. Conversion costs are allocated evenly throughout production.

Data for Department A for February 2012 are:
- Work in process, beginning inventory, 40% converted 200 units
- Units started during February 600 units
- Work in process, ending inventory: 100 units
  - 30% complete as to conversion costs
  - 100% complete as to materials

Costs for the Department A for February 2012 are:
- Work in process, beginning inventory:
  - Direct materials $200,000
  - Conversion costs $200,000
- Direct materials costs added during February $2,000,000
- Conversion costs added during February $2,500,000

What were the equivalent units of direct materials and conversion costs, respectively, at the end of February? Assume Dustin Plastics, Inc., uses the weighted-average process costing method.
A) 800; 730
B) 800; 800
C) 800; 700
D) 600; 500

Answer: A
Explanation: A) Equivalent units of direct materials under weighted average = units completed + equivalent units in ending inventory = 700 + 100
Conversion costs = 700 + (100 × 30%) = 730
Diff: 2
Terms: equivalent units
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

Roosevelt Cabinetry, Inc., manufactures standard sized modular cabinet units for kitchens and other applications within the home. Its costing system utilizes two cost categories, direct materials and conversion costs. Each product must pass through the rough cut department and the finish department. Direct materials are added at the beginning of production. Conversion costs are allocated evenly throughout production.

Data for Finish Department for March 2012 are:
- Work in process, beginning inventory, 25% converted: 1,000 units
- Units started during February: 1,400 units
- Work in process, ending inventory: 300 units

Costs for Finish department for March 2012 are:
- Work in process, beginning inventory:
  - Direct materials: $300,000
  - Conversion costs: $200,000
- Direct materials costs added during February: $420,000
- Conversion costs added during February: $1,600,000

7) What is the unit cost per equivalent unit of the beginning inventory in the Finishing Department?
A) $800.00
B) $300.00
C) $1,100.00
D) $500.00
Answer: C
Explanation:
C) Direct materials per unit ($300,000/1,000 units) $ 300
Conversion costs per unit ($200,000/(1,000 × 0.25) units) 800
Total costs per unit $ 1,100
Diff: 2
Terms: equivalent units
Objective: 3
AACSB: Analytical skills

8) How many units were completed and transferred out of the Finishing Department during March?
A) 1,000 units
B) 1,400 units
C) 2,100 units
D) Unknown
Answer: C
Diff: 2
Terms: equivalent units
Objective: 3
AACSB: Analytical skills
9) The last step in a process-costing system is to compute cost per equivalent unit.
Answer: FALSE
Explanation: The last step in a process-costing system is to assign total costs to units completed and to units in ending work in process.
Diff: 2
Terms: process costing
Objective: 3
AACSB: Reflective thinking

10) The equivalent unit concept is a means by which a process costing system can compare partially completed work done in each of the various process categories to obtain a total measure of work done.
Answer: TRUE
Diff: 2
Terms: process costing
Objective: 3
AACSB: Reflective thinking

11) Equivalent units are calculated separately for each input.
Answer: TRUE
Diff: 2
Terms: equivalent units
Objective: 3
AACSB: Reflective thinking

12) In a process-costing system, there is always a separate Work-in-Process account for each different process.
Answer: TRUE
Diff: 2
Terms: process costing
Objective: 3
AACSB: Reflective thinking

13) A production cost worksheet is used to summarize total costs to account for, compute cost per equivalent unit, and assign total costs to units completed and to units in ending work-in-process.
Answer: TRUE
Explanation: A production cost worksheet is used to summarize total costs to account for, compute cost per equivalent unit, and assign total costs to units completed and to units in ending work-in-process.
Diff: 2
Terms: process costing
Objective: 3
AACSB: Reflective thinking

14) Process-costing journal entries and job-costing journal entries are similar with respect to direct materials and conversion costs.
Answer: TRUE
Diff: 2
Terms: process-costing system
Objective: 3
AACSB: Reflective thinking
15) The accounting entry to record the transfer of rolls from the assembly department to the finishing department is:

Work in Process-Assembly Department
   Work in Process-Finishing Department
Answer: FALSE
Explanation: The correct accounting entry is the opposite of the entry shown here.
Diff: 2
Terms: process-costing system
Objective: 3
AACSB: Communication

16) The Zygon Corporation was recently formed to produce a semiconductor chip that forms an essential part of the personal computer manufactured by a major corporation. The direct materials are added at the start of the production process while conversion costs are added uniformly throughout the production process. June is Zygon's first month of operations, and therefore, there was no beginning inventory. Direct materials cost for the month totaled $895,000, while conversion costs equaled $4,225,000. Accounting records indicate that 475,000 chips were started in June and 425,000 chips were completed.

Ending inventory was 50% complete as to conversion costs.

Required:

a. What is the total manufacturing cost per chip for June?

b. Allocate the total costs between the completed chips and the chips in ending inventory.

Answer:

<table>
<thead>
<tr>
<th></th>
<th>Direct Materials</th>
<th>Conversion Costs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost to account for</td>
<td>$895,000</td>
<td>$4,225,000</td>
<td>$5,120,000</td>
</tr>
<tr>
<td>Divided by equiv units</td>
<td>475,000</td>
<td>450,000</td>
<td></td>
</tr>
<tr>
<td>Cost per equivalent units</td>
<td>$1.88</td>
<td>$9.39</td>
<td>$11.27</td>
</tr>
</tbody>
</table>

Equivalent unit for conversion costs =

\[
\frac{425,000 \text{ completed} + (50,000 \times 0.5 \text{ completed})}{425,000 + 25,000} = 450,000
\]

b. Completed units = $11.27 \times 425,000 = $4,789,750 Rounded

Ending work in process = Direct materials = 50,000 $1.88 = $94,000
Conversion costs = 25,000 $9.39 = 234,750

Total = $328,750 Rounded

Diff: 2
Terms: process-costing system, equivalent units
Objective: 3
AACSB: Analytical skills
17) The Parson Valve Corporation was recently formed to produce a brass valve that forms an essential part of a compressor manufactured by a major corporation. The direct materials are added at the start of the production process while conversion costs are added uniformly throughout the production process. September is Parson's first month of operations, and therefore, there was no beginning inventory. Direct materials cost for the month totaled $1,400,000, while conversion costs equaled $1,800,000. Accounting records indicate that 800,000 valves were started in September and 700,000 valves were completed.

Ending inventory was 20% complete as to conversion costs.

**Required:**

a. What is the total manufacturing cost per valve for September?
b. Allocate the total costs between the completed valves and the valves in ending inventory.

**Answer:**

<table>
<thead>
<tr>
<th></th>
<th>Direct Materials</th>
<th>Conversion Costs</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost to account for</td>
<td>$1,400,000</td>
<td>$1,800,000</td>
<td>$3,200,000</td>
</tr>
<tr>
<td>Divided by equiv. units</td>
<td>800,000</td>
<td>720,000</td>
<td></td>
</tr>
<tr>
<td>Cost per equivalent units</td>
<td>$1.75</td>
<td>$2.50</td>
<td>$4.25</td>
</tr>
</tbody>
</table>

Equivalent unit for conversion costs =

\[
\frac{700,000 \text{ completed} + (100,000 \times 0.2 \text{ completed})}{700,000 + 20,000} = 720,000
\]

b. Completed units = $4.25 \times 700,000 = $2,975,000

Ending work in process = Direct materials = 100,000 \times $1.75 = $175,000

Conversion costs = 20,000 \times $2.50 = 50,000

Total = $225,000

**Diff:** 2

**Terms:** process-costing system, equivalent units

**Objective:** 3

**AACSB:** Analytical skills
18) Cedar Rapids Chemical placed 220,000 liters of direct materials into the mixing process. At the end of the month, 10,000 liters were still in process, 30% converted as to labor and factory overhead. All direct materials are placed in mixing at the beginning of the process and conversion costs occur evenly during the process. Cedar Rapids Chemical uses weighted-average costing.

**Required:**

a. Determine the equivalent units in process for direct materials and conversion costs, assuming there was no beginning inventory.

b. Determine the equivalent units in process for direct materials and conversion costs, assuming that 12,000 liters of chemicals were 40% complete prior to the addition of the 220,000 liters.

**Answer:**

a. Direct materials:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning inventory</td>
<td>0 liters</td>
</tr>
<tr>
<td>Units started</td>
<td>220,000 liters</td>
</tr>
<tr>
<td>Equivalent units</td>
<td>220,000 liters</td>
</tr>
</tbody>
</table>

Conversion costs:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning inventory</td>
<td>0 liters</td>
</tr>
<tr>
<td>Units started</td>
<td>220,000 liters</td>
</tr>
<tr>
<td>To account for</td>
<td>220,000 liters</td>
</tr>
<tr>
<td>Units transferred out</td>
<td>210,000 liters</td>
</tr>
<tr>
<td>Ending inventory</td>
<td>10,000 liters</td>
</tr>
<tr>
<td>Units transferred out</td>
<td>210,000 liters</td>
</tr>
<tr>
<td>Ending inventory, 30% complete</td>
<td>3,000 liters</td>
</tr>
<tr>
<td>Equivalent units</td>
<td>213,000 liters</td>
</tr>
</tbody>
</table>

b. Direct materials:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed and transferred out</td>
<td>222,000 liters</td>
</tr>
<tr>
<td>Ending inventory, 100% complete</td>
<td>10,000 liters</td>
</tr>
<tr>
<td>Equivalent units</td>
<td>232,000 liters</td>
</tr>
</tbody>
</table>

Conversion costs:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed and transferred out</td>
<td>222,000 liters</td>
</tr>
<tr>
<td>Ending inventory, 30% complete</td>
<td>3,000 liters</td>
</tr>
<tr>
<td>Equivalent units</td>
<td>225,000 liters</td>
</tr>
</tbody>
</table>

Diff: 2

Terms: weighted-average process-costing method, equivalent units

Objective: 3

AACSB: Analytical skills
19) Creative Colors Paint Company placed 315,000 gallons of direct materials into the mixing process. All direct materials are placed in mixing at the beginning of the process and conversion costs occur evenly during the process. Creative Colors uses weighted-average costing. The initial forecast for the end of the month was to have 75,000 gallons still in process, 15% converted as to labor and factory overhead.

**Required:**

a. Determine the total equivalent units (in process and transferred out) for direct materials and for conversion costs, assuming there was no beginning inventory.

b. With the installation of a new paint processing filtration device, the forecast for the end of the month was to have 50,000 gallons still in process, 70% converted as to labor and factory overhead. In this event, determine the equivalent units (in process and transferred out) for direct materials and for conversion costs, assuming there was no beginning inventory.

**Answer:**

a. **Direct materials:**

<table>
<thead>
<tr>
<th></th>
<th>0 gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning inventory</td>
<td>0 gallons</td>
</tr>
<tr>
<td>Units started</td>
<td>315,000</td>
</tr>
<tr>
<td>Equivalent units</td>
<td>315,000</td>
</tr>
</tbody>
</table>

**Conversion costs:**

<table>
<thead>
<tr>
<th></th>
<th>0 gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning inventory</td>
<td>0 gallons</td>
</tr>
<tr>
<td>Units started</td>
<td>315,000</td>
</tr>
<tr>
<td>To account for</td>
<td>315,000</td>
</tr>
<tr>
<td>Units transferred out</td>
<td>240,000</td>
</tr>
<tr>
<td>Ending inventory</td>
<td>75,000</td>
</tr>
<tr>
<td>Units transferred out</td>
<td>240,000</td>
</tr>
<tr>
<td>Ending inventory, 15% complete</td>
<td>11,250</td>
</tr>
<tr>
<td>Equivalent units</td>
<td>251,250</td>
</tr>
</tbody>
</table>

b. **Direct materials:**

<table>
<thead>
<tr>
<th></th>
<th>0 gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning inventory</td>
<td>0 gallons</td>
</tr>
<tr>
<td>Units started</td>
<td>315,000</td>
</tr>
<tr>
<td>Equivalent units</td>
<td>315,000</td>
</tr>
</tbody>
</table>

**Conversion costs:**

<table>
<thead>
<tr>
<th></th>
<th>0 gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning inventory</td>
<td>0 gallons</td>
</tr>
<tr>
<td>Units started</td>
<td>315,000</td>
</tr>
<tr>
<td>To account for</td>
<td>315,000</td>
</tr>
<tr>
<td>Units transferred out</td>
<td>265,000</td>
</tr>
<tr>
<td>Ending inventory</td>
<td>50,000</td>
</tr>
<tr>
<td>Units transferred out</td>
<td>265,000</td>
</tr>
<tr>
<td>Ending inventory, 70% complete</td>
<td>35,000</td>
</tr>
<tr>
<td>Equivalent units</td>
<td>300,000</td>
</tr>
</tbody>
</table>

**Diff: 2**

Terms: weighted-average process-costing method, equivalent units

Objective: 3

AACSB: Analytical skills
20) Jordana Woolens is a manufacturer of wool cloth. The information for March is as follows:

<table>
<thead>
<tr>
<th>Beginning work in process</th>
<th>10,000 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units started</td>
<td>20,000 units</td>
</tr>
<tr>
<td>Units completed</td>
<td>25,000 units</td>
</tr>
</tbody>
</table>

| Beginning work-in-process direct materials | $ 6,000 |
| Beginning work-in-process conversion     | $ 2,600 |
| Direct materials added during month      | $30,000 |
| Direct manufacturing labor during month  | $12,000 |
| Factory overhead                         | $ 5,000 |

Beginning work in process was half converted as to labor and overhead. Direct materials are added at the beginning of the process. All conversion costs are incurred evenly throughout the process. Ending work in process was 60% complete.

**Required:**
Prepare a production cost worksheet using the weighted-average method. Include any necessary supporting schedules.

**Answer:**

**PRODUCTION COST WORKSHEET**

<table>
<thead>
<tr>
<th>Flow of production</th>
<th>Physical Units</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>10,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Started during period</td>
<td>20,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To account for</td>
<td>30,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Units completed</td>
<td>25,000</td>
<td>25,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Work in process, ending</td>
<td>5,000</td>
<td>5,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Accounted for</td>
<td>30,000</td>
<td>30,000</td>
<td>28,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Costs</th>
<th>Totals</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>$ 8,600</td>
<td>$ 6,000</td>
<td>$ 2,600</td>
</tr>
<tr>
<td>Costs added during period</td>
<td>47,000</td>
<td>30,000</td>
<td>17,000</td>
</tr>
<tr>
<td>Total costs to account for</td>
<td>$55,600</td>
<td>$36,000</td>
<td>$19,600</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td></td>
<td>30,000</td>
<td>28,000</td>
</tr>
<tr>
<td>Equivalent unit costs</td>
<td>$ 1.90</td>
<td>$ 1.20</td>
<td>$ 0.70</td>
</tr>
</tbody>
</table>
**Assignment of costs**

<table>
<thead>
<tr>
<th>Costs transferred out (25,000 × $1.90)</th>
<th>$47,500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, ending</td>
<td></td>
</tr>
<tr>
<td>Direct materials (5,000 × $1.20)</td>
<td>6,000</td>
</tr>
<tr>
<td>Conversion (5,000 × $0.70 × 0.60)</td>
<td>2,100</td>
</tr>
<tr>
<td>Costs accounted for</td>
<td>$55,600</td>
</tr>
</tbody>
</table>

21) List and describe the five steps in process costing.

Answer: Step 1 involves summarizing the physical flow of the units of output. Step 2 involves determining the number output expressed in terms of equivalent units. This means determining how many complete units would have been done with the materials, time, and effort expended had units been done one at a time. The third step involves computing the cost per equivalent unit determining how much a whole unit cost for each item this period. In the fourth step, the costs that need to be assigned to the units are summarized. The fifth step involves assigning the costs to the completed units and the units still remaining in work in process.

22) Marv and Vicki own and operate a vegetable canning plant. In recent years, their business has grown tremendously and, at any point in time, they may have 30 to 35 different vegetables being processed. Also, during the peak summer months there are several thousand bushels of vegetables in some stage of processing at any one time. With the company's growth during the past few years, the owners decided to employ an accountant to provide cost estimations on each vegetable category and prepare monthly financial statements. Although the accountant is doing exactly as instructed, Marv and Vicki are confused about the monthly operating costs. Although they process an average of 50,000 canned units a month, the monthly production report fluctuates wildly.

**Required:**

Explain how the production report can fluctuate wildly if they process a constant amount of vegetables each month.

Answer: It appears that the accountant may not be using equivalent units of production but he or she is only including completed units when preparing the monthly reports. Particularly with large summer inventories, the number and value associated costs with ending work in process could cause wide fluctuations between months if the equivalent unit concept is ignored. The accountant should start using equivalent units to determine the costs to assign to finished goods and ending work in process each month.
Objective 17.4

1) The weighted-average process-costing method calculates the equivalent units by:
A) considering only the work done during the current period
B) the units started during the current period minus the units in ending inventory
C) the units started during the current period plus the units in ending inventory
D) the equivalent units completed during the current period plus the equivalent units in ending inventory
Answer:  D
Diff: 2
Terms:  weighted-average process-costing method, equivalent units
Objective:  4
AACSB:  Reflective thinking

2) In the computation of the cost per equivalent unit, the weighted-average method of process costing considers all the costs:
A) entering work in process from the units in beginning inventory plus the costs for the work completed during the current accounting period
B) costs that have entered work in process from the units started or transferred in during the current accounting period
C) that have entered work in process during the current accounting period from the units started or transferred in minus the costs associated with ending inventory
D) that have entered work in process during the current accounting period from the units started or transferred in plus the costs associated with ending inventory
Answer:  A
Diff: 3
Terms:  equivalent units
Objective:  4
AACSB:  Reflective thinking

3) If there was no beginning work in process and no ending work in process under the weighted-average process costing method, the number of equivalent units for direct materials, if direct materials were added at the start of the process, would be:
A) equal to the units started or transferred in
B) equal to the units completed
C) less than the units completed
D) Both A and B are correct.
Answer:  D
Diff: 3
Terms:  weighted-average process-costing method, equivalent units
Objective:  4
AACSB:  Reflective thinking
4) Under the weighted-average method, the stage of completion of beginning work in process:
A) is relevant in determining the equivalent units
B) must be combined with the work done during the current period to determine the equivalent units
C) is irrelevant in determining the equivalent-unit calculation
D) can almost always be determined with a high degree of precision
Answer: C
Diff: 2
Terms: weighted-average process-costing method, equivalent units
Objective: 4
AACSB: Reflective thinking

Answer the following questions using the information below:

The Cuckoo Clock Shop manufactures clocks on a highly automated assembly line. Its costing system uses two cost categories, direct materials and conversion costs. Each product must pass through the Assembly Department and the Testing Department. Direct materials are added at the beginning of the production process. Conversion costs are allocated evenly throughout production. Cuckoo Clock Shop uses weighted-average costing.

**Data for the Assembly Department for June 2013 are:**

- Work in process, beginning inventory: 250 units
  - Direct materials (100% complete)
  - Conversion costs (50% complete)
- Units started during June: 800 units
- Work in process, ending inventory: 150 units
  - Direct materials (100% complete)
  - Conversion costs (75% complete)

**Costs for June 2013:**

- Work in process, beginning inventory:
  - Direct materials: $90,000
  - Conversion costs: $135,000
- Direct materials costs added during June: $500,000
- Conversion costs added during June: $500,000

5) What are the equivalent units for direct materials and conversion costs, respectively, for June?
A) 1,200.5 units; 1,160.64 units
B) 1,050 units; 1,012.5 units
C) 1,050 units; 1,050 units
D) 962 units; 990 units
Answer: B

**Explanation:**

<table>
<thead>
<tr>
<th></th>
<th>Direct materials</th>
<th>Conversion costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed and transferred out</td>
<td>900</td>
<td>900.0</td>
</tr>
<tr>
<td>Work in process, ending</td>
<td>150</td>
<td>112.5</td>
</tr>
<tr>
<td>Total equivalent units</td>
<td><strong>1,050</strong></td>
<td><strong>1,012.5</strong></td>
</tr>
</tbody>
</table>
6) What is the total amount debited to the Work-in-Process account during the month of June?
A) $225,000
B) $1,000,000
C) $1,135,000
D) $1,225,000
Answer: B
Explanation: B) $500,000 + $500,000 = $1,000,000

7) What is the direct materials cost per equivalent unit during June?
A) $561.90
B) $865.10
C) $789.50
D) $945.18
Answer: A
Explanation: A) 

| Completed and transferred out | 900 | 900.0 |
| Work in process, ending      | 150 | 112.5 |
| Total equivalent units       | 1,050 | 1,012.5 |

$90,000 + $500,000 = $590,000
$590,000/1,050 units = $561.90
8) What is the conversion cost per equivalent unit in June?
A) $627.16
B) $789.57
C) $865.10
D) $945.18
Answer: A
Explanation: A) Direct materials  Conversion costs
Completed and transferred out  900  900.0
Work in process, ending  150  112.5
Total equivalent units  1,050  1,012.5

$135,000 + $500,000 = $635,000
$635,000/1,012.5 = $627.16
Diff: 3
Terms: weighted-average process-costing method, equivalent units
Objective: 4
AACSB: Analytical skills

9) What amount of direct materials costs is assigned to the ending Work-in-Process account for June?
A) $84,285
B) $141,776.25
C) $129,765
D) $118,425
Answer: A
Explanation: A) Direct materials  Conversion costs
Completed and transferred out  900  900.0
Work in process, ending  150  112.5
Total equivalent units  1,050  1,012.5

($500,000 = $90,000)/1,050= $561.90 cost per equivalent unit
$561.90 × 150= $84,285
Diff: 3
Terms: weighted-average process-costing method
Objective: 4
AACSB: Analytical skills

10) What amount of conversion costs are assigned to the ending Work-in-Process account for June?
A) $509,78.32
B) $70,555.50
C) $63,225.25
D) $90,074
Answer: B
Explanation: B) $135,000 + $500,000 = $635,000
$635,000/1,012.5 = $627.16

(150 units × 75%) × $627.16 = $70,555.50
Diff: 3
Terms: weighted-average process-costing method
Objective: 4
AACSB: Analytical skills
Answer the following questions using the information below:

The Daltry Tractor Company manufactures small garden tractors on a highly automated assembly line. Its costing system uses two cost categories, direct materials and conversion costs. Each tractor must pass through the Assembly Department and the Testing Department. Direct materials are added at the beginning of the production process. Conversion costs are allocated evenly throughout production. Daltry Tractor uses weighted-average costing.

Data for the Assembly Department for April 2012 are:

- Work in process, beginning inventory: 400 units
  - Direct materials (100% complete)
  - Conversion costs (30% complete)
- Units started during April: 1,200 units
- Work in process, ending inventory: 250 units
  - Direct materials (100% complete)
  - Conversion costs (50% complete)

Costs for April 2012:

- Work in process, beginning inventory:
  - Direct materials: $230,000
  - Conversion costs: $220,000
- Direct materials costs added during April: $700,000
- Conversion costs added during April: $1,175,000

11) What are the equivalent units for direct materials and conversion costs, respectively, for April?
A) 1,350 units; 1,350 units
B) 1,600 units; 1,600 units
C) 1,600 units; 1,475 units
D) 250 units; 125 units

Answer: C
Explanation: C) 
Completed and transferred out: 1,350 units; 1,350 units 
Work in process, ending: 250 units; 125 units 
Total equivalent units: 1,600 units; 1,475 units 

Terms: weighted-average process-costing method, equivalent units
Objective: 4
AACSB: Analytical skills
12) What is the total amount debited to the Work-in-Process account during the month of April?
A) $230,000
B) $430,000
C) $1,875,000
D) $2,855,000
Answer: C
Explanation: C) $700,000 + $1,175,000 = $1,875,000
Diff: 1
Terms: weighted-average process-costing method, equivalent units
Objective: 4
AACSB: Analytical skills

13) What is the direct materials cost per equivalent unit during April?
A) $1,250.00
B) $1,241.94
C) $575.00
D) $581.25
Answer: D
Explanation: D) Direct materials
Conversion costs
Completed and transferred out 1,350 1,350
Work in process, ending 250 125
Total equivalent units 1,600 1,475
$230,000 + $700,000 = $930,000
$930,000/1,600 units = $581.25
Diff: 3
Terms: weighted-average process-costing method, equivalent units
Objective: 4
AACSB: Analytical skills

14) What is the conversion cost per equivalent unit in April?
A) $1,250.00
B) $945.76
C) $872.50
D) $1,033.00
Answer: B
Explanation: B) Direct materials
Conversion costs
Completed and transferred out 1,350 1,350
Work in process, ending 250 125
Total equivalent units 1,600 1,475
$220,000 + $1,175,000 = $1,395,000
$1,395,000/1,475 units = $945.76
Diff: 3
Terms: weighted-average process-costing method, equivalent units
Objective: 4
AACSB: Analytical skills
15) What amount of direct materials costs are assigned to the ending Work-in-Process account for April?
A) $248,387.10
B) $250,000.00
C) $143,750.00
D) $145,312.50
Answer: D
Explanation: D) Direct materials

<table>
<thead>
<tr>
<th></th>
<th>Direct materials</th>
<th>Conversion costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed and transferred out</td>
<td>1,350</td>
<td>1,350</td>
</tr>
<tr>
<td>Work in process, ending</td>
<td>250</td>
<td>200</td>
</tr>
<tr>
<td>Total equivalent units</td>
<td>1,600</td>
<td>1,550</td>
</tr>
</tbody>
</table>

$230,000 + $700,000 = $930,000
$930,000/1,600 units = $581.25
250 units × $581.25 = $145,312.50

Diff: 3
Terms: weighted-average process-costing method
Objective: 4
AACSB: Analytical skills

16) What amount of conversion costs are assigned to the ending Work-in-Process account for April?
A) $236,440.00
B) $145,312.50
C) $118,220.00
D) $250,000.00
Answer: C
Explanation: C) Conversion costs

<table>
<thead>
<tr>
<th></th>
<th>Direct materials</th>
<th>Conversion costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed and transferred out</td>
<td>1,350</td>
<td>1,350</td>
</tr>
<tr>
<td>Work in process, ending</td>
<td>250</td>
<td>125</td>
</tr>
<tr>
<td>Total equivalent units</td>
<td>1,600</td>
<td>1,475</td>
</tr>
</tbody>
</table>

$220,000 + $1,175,000 = $1,395,000
$1,395,000/1,475 units = $945.76
125 units × $900.00 = $118,220

Diff: 3
Terms: weighted-average process-costing method
Objective: 4
AACSB: Analytical skills
Answer the following questions using the information below:

The Lumbar Chair Company manufacturers a standard recliner. During February, the firm's Assembly Department started production of 150,000 chairs. During the month, the firm completed 170,000 chairs and transferred them to the Finishing Department. The firm ended the month with 20,000 chairs in ending inventory. All direct materials costs are added at the beginning of the production cycle. Weighted-average costing is used by Lumbar.

17) How many chairs were in inventory at the beginning of the month? Conversion costs are incurred uniformly over the production cycle.
   A) 10,000 chairs
   B) 20,000 chairs
   C) 30,000 chairs
   D) 40,000 chairs
   Answer:  D
   Diff: 2
   Terms: weighted-average process-costing method
   Objective:  4
   AACSB: Analytical skills

18) What were the equivalent units for materials for February?
   A) 190,000 chairs
   B) 170,000 chairs
   C) 160,000 chairs
   D) 150,000 chairs
   Answer:  A
   Explanation:  A) 20,000 + 170,000 = 190,000
   Diff: 3
   Terms: weighted-average process-costing method, equivalent units
   Objective:  4
   AACSB: Analytical skills

19) What were the equivalent units for conversion costs for February if the beginning inventory was 70% complete as to conversion costs and the ending inventory was 40% complete as to conversion costs?
   A) 178,000
   B) 150,000
   C) 170,000
   D) 190,000
   Answer:  A
   Explanation:  A) 170,000 + (0.4 \times 20,000) = 178,000
   Diff: 3
   Terms: weighted-average process-costing method, equivalent units
   Objective:  4
   AACSB: Analytical skills
20) Of the 150,000 units Lumbar started during February, how many were finished during the month?
A) 150,000
B) 170,000
C) 130,000
D) 190,000
Answer: C
Explanation: C) 150,000 - 20,000 = 130,000
Diff: 3
Terms: weighted-average process-costing method
Objective: 4
AACSB: Analytical skills

21) Weighty Steel processes a single type of steel. For the current period the following information is given:

<table>
<thead>
<tr>
<th></th>
<th>Units</th>
<th>Material Costs</th>
<th>Conversion Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning Inventory</td>
<td>3,000</td>
<td>$4,500</td>
<td>$5,400</td>
</tr>
<tr>
<td>Started During the Current Period</td>
<td>20,000</td>
<td>$32,000</td>
<td>$78,200</td>
</tr>
<tr>
<td>Ending Inventory</td>
<td>2,500</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All materials are added at the beginning of the production process. The beginning inventory was 40% complete as to conversion, while the ending inventory was 30% completed for conversion purposes.

Weighty uses the weighted-average costing method.

What is the total cost assigned to the units completed and transferred this period?
A) $107,010
B) $109,440
C) $113,160
D) $120,100
Answer: C
Explanation: C) EU (materials) = 20,500 + (2,500 × 100%) = 23,000.
($4,500 + $32,000) / 23,000 = $1.59 per unit for material
EU (conversion) = 20,500 + (2,500 × 30%) = 21,250.
($5,400 + $78,200) / 21,250 = $3.93 per unit for conversion.
Total cost per unit = $1.59 + $3.93 = $5.52
Cost of transferred units = 20,500 × $5.52 = $113,160
Diff: 3
Terms: weighted-average process-costing method
Objective: 4
AACSB: Analytical skills
22) A distinct feature of the FIFO process-costing method is that the:
A) work done on beginning inventory before the current period is blended with the work done during the current period in the calculation of equivalent units
B) work done on beginning inventory before the current period is kept separate from the work done during the current period in the calculation of equivalent units
C) work done on ending inventory is kept separate from the work done during the current period in the calculation of equivalent units and is usually not included in the calculation
D) FIFO process-costing method is only minimally different from the weighted-average process-costing method
Answer:  B
Diff: 2
Terms:  first-in, first-out (FIFO) process-costing method
Objective:  4
AACSB:  Reflective thinking

23) On occasion, the FIFO and the weighted-average methods of process costing will result in the same dollar amount of costs being transferred to the next department. Which of the following scenarios would have that result?
A) when the beginning and ending inventories are equal in terms of unit numbers
B) when the beginning and ending inventories are equal in terms of the percentage of completion for both direct materials, and conversion costs
C) when there is no ending inventory
D) when there is no beginning inventory
Answer:  D
Diff: 2
Terms:  FIFO process-costing method, weighted-average process-costing method
Objective:  4
AACSB:  Reflective thinking

24) An assumption of the FIFO process-costing method is that:
A) the units in beginning inventory are not necessarily assumed to be completed by the end of the period
B) the units in beginning inventory are assumed to be completed first
C) ending inventory will always be completed in the next accounting period
D) no calculation of conversion costs is possible
Answer:  B
Diff: 2
Terms:  first-in, first-out (FIFO) process-costing method
Objective:  4
AACSB:  Reflective thinking
Answer the following questions using the information below:

The Rest-a-Lot chair company manufacturers a standard recliner. During February, the firm's Assembly Department started production of 75,000 chairs. During the month, the firm completed 80,000 chairs, and transferred them to the Finishing Department. The firm ended the month with 10,000 chairs in ending inventory. There were 15,000 chairs in beginning inventory. All direct materials costs are added at the beginning of the production cycle and conversion costs are added uniformly throughout the production process. The FIFO method of process costing is used by Rest-a-Lot. Beginning work in process was 30% complete as to conversion costs, while ending work in process was 80% complete as to conversion costs.

**Beginning inventory:**
- Direct materials $24,000
- Conversion costs $35,000

**Manufacturing costs added during the accounting period:**
- Direct materials $168,000
- Conversion costs $278,000

25) How many of the units that were started during February were completed during February?
A) 85,000
B) 80,000
C) 75,000
D) 65,000
Answer: D
Explanation: D) 75,000 - 10,000 = 65,000
Diff: 2
Terms: first-in, first-out (FIFO) process-costing method
Objective: 4
AACSB: Analytical skills

26) What were the equivalent units for conversion costs during February?
A) 83,500
B) 85,000
C) 75,000
D) 79,500
Answer: A
Explanation: A) \((15,000 \times 0.7) + 65,000 + (10,000 \times 0.8) = 83,500\)
Diff: 2
Terms: first-in, first-out (FIFO) process-costing method, equivalent units
Objective: 4
AACSB: Analytical skills
27) What is the amount of direct materials cost assigned to ending work-in-process inventory at the end of February?
A) $19,200  
B) $22,400  
C) $25,600  
D) $22,500  
Answer: B  
Explanation: B) $168,000/75,000 = $2.24 × 10,000 = $22,400  
Diff: 3  
Terms: first-in, first-out (FIFO) process-costing method  
Objective: 4  
AACSB: Analytical skills

28) What is the cost of the goods transferred out during February?
A) $417,750  
B) $456,015  
C) $476,750  
D) $505,000  
Answer: B  
Explanation: B) 75,000 - 10,000 = 65,000  
(15,000 × 0.7) + 65,000 + (10,000 × 0.8) = 83,500  
$168,000/75,000 = $2.24 × 10,000 = $22,400  
The costs in beginning inventory $24,000 + $35,000 = $ 59,000  
Direct materials = $2.24 x 65,000 = 145,600  
Conversion costs =  
[($278,000/(10,500 + 8,000 + 65,000)) × 65,000 = 216,450  
also FG beginning inventory (15,000 × 0.7 × $3.33) = 34,965  
Total $456,015  
Diff: 3  
Terms: first-in, first-out (FIFO) process-costing method, equivalent units  
Objective: 4  
AACSB: Analytical skills
Answer the following questions using the information below:

The Morgan Models company manufacturers replica plastic airplane and motorized vehicle models. During October, the firm's Assembly Department started production of 60,000 models. During the month, the firm completed 66,000 models, and transferred them to the Finishing Department. The firm ended the month with 22,000 models in ending inventory. There were 28,000 models in beginning inventory. All direct materials costs are added at the beginning of the production cycle and conversion costs are added uniformly throughout the production process. The FIFO method of process costing is used by Morgan. Beginning work in process was 25% complete as to conversion costs, while ending work in process was 50% complete as to conversion costs.

**Beginning inventory:**
- Direct materials costs $39,200
- Conversion costs $30,800

**Manufacturing costs added during the accounting period:**
- Direct materials costs $90,000
- Conversion costs $280,000

29) How many of the units that were started during October were completed during October?
A) 30,000
B) 38,000
C) 32,000
D) 60,000
Answer: B
Explanation: B) 60,000 - 22,000 = 38,000
Diff: 2
Terms: first-in, first-out (FIFO) process-costing method
Objective: 4
AACSB: Analytical skills

30) What were the equivalent units for conversion costs during October?
A) 21,000
B) 62,000
C) 70,000
D) 87,000
Answer: C
Explanation: C) \((28,000 \times 0.75) + 38,000 + (22,000 \times .50) = 70,000\)
Diff: 2
Terms: first-in, first-out (FIFO) process-costing method, equivalent units
Objective: 4
AACSB: Analytical skills
31) What is the amount of direct materials cost assigned to ending work-in-process inventory at the end of October?
A) $22,000
B) $44,000
C) $39,200
D) $33,000
Answer: D
Explanation: D) $90,000/60,000 = $1.50 × 22,000 = $33,000
Diff: 3
Terms: first-in, first-out (FIFO) process-costing method
Objective: 4
AACSB: Analytical skills

32) What is the cost of the goods transferred out during October?
A) $363,000
B) $330,000
C) $340,000
D) $375,000
Answer: A
Explanation: A) 60,000 - 22,000 = 38,000
(28,000 × 0.75) + 38,000 + (22,000 × 0.5) = 70,000
$90,000/60,000 = $1.50 × 22,000 = $33,000
The costs in beginning inventory $39,200 + $30,800 = $70,000
Direct materials = $1.50 x 38,000 = 57,000
Conversion costs =
[
\left\{\frac{280,000}{21,000 + 11,000 + 38,000}\right\} × 38,000 = 152,000
\]
also FG beginning inventory (28,000 × 0.75 × $4.00) = 84,000
Total $363,000
Diff: 3
Terms: first-in, first-out (FIFO) process-costing method, equivalent units
Objective: 4
AACSB: Analytical skills

33) A reason(s) why "pure" FIFO is rarely encountered in process costing is that:
A) FIFO is usually applied within a department to compute the cost of units transferred out
B) the units transferred into the department during a given time period are usually carried at a single average unit cost
C) tracking costs on a "pure" FIFO basis is very difficult
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: first-in, first-out (FIFO) process-costing method
Objective: 4
AACSB: Reflective thinking
34) Operating income can differ materially between the results for the weighted-average and FIFO methods when:
A) direct materials or conversion costs per unit vary significantly from period to period
B) the physical inventory levels of work in process are large relative to the total number of units transferred out
C) Neither of these answers is correct.
D) Both of these answers is correct.
Answer: D
Diff: 2
Terms: weighted-average process-costing method, FIFO process-costing method
Objective: 4
AACSB: Reflective thinking

35) A major advantage of using the FIFO process-costing method is that:
A) FIFO makes the unit cost calculations simpler
B) in contrast with the weighted-average method, FIFO is considered GAAP
C) FIFO provides managers with information about changes in the costs per unit from one period to the next
D) All of these answers are correct.
Answer: C
Diff: 2
Terms: first-in, first-out (FIFO) process-costing method
Objective: 4
AACSB: Communication

36) A disadvantage of the weighted-average method compared to the FIFO process-costing method is that:
A) FIFO is computationally simpler
B) FIFO provides better management information for planning and control purposes
C) when unit cost per input prices fluctuate markedly from month to month, its per unit cost is less representative than FIFO
D) the information it provides about changes in unit prices from one period to the next is less useful than the information provided by FIFO
Answer: D
Diff: 2
Terms: weighted-average process-costing method, FIFO process-costing method
Objective: 4
AACSB: Reflective thinking

37) Activity-based costing has less applicability in a process-costing environment because:
A) the use of activity-based costing makes the computational process more difficult
B) the products tend to be similar and thus use the resources in a similar manner
C) cost control in process costing is achieved by controlling the cost of the various processes rather than the individual activities
D) Both B and C are correct.
Answer: D
Diff: 2
Terms: process-costing system
Objective: 4
AACSB: Reflective thinking
38) FIFO Aluminum processes a single type of aluminum. During the current period the following information was given:

<table>
<thead>
<tr>
<th>Units</th>
<th>Material Costs</th>
<th>Conversion Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>3,000</td>
<td>$4,500</td>
<td>$4,800</td>
</tr>
<tr>
<td>20,000</td>
<td>48,000</td>
<td>65,000</td>
</tr>
<tr>
<td>2,500</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All materials are added at the beginning of the production process. The beginning inventory was 30% complete as to conversion, while the ending inventory was 40% completed for conversion purposes.

FIFO Aluminum uses the first-in, first-out system of process costing.

What were the costs assigned to the units transferred out this period (round equivalent unit cost to the nearest penny)?
A) $113,160  
B) $113,236  
C) $113,980  
D) $122,300  
Answer: B

39) Standard costing is popular among companies that:
A) produce masses of similar or identical products  
B) manufacture textiles or ceramics  
C) produce a product that uses few direct materials items, and has relatively few operational activities  
D) All of these answers are correct.
Answer: D

40) The weighted-average process costing method does NOT distinguish between units started in the previous period but completed during the current period and units started and completed during the current period.
Answer: TRUE

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41) Equivalent units in beginning work in process PLUS equivalent units of work done in the current period MINUS equivalent units completed and transferred out in the current period EQUALS equivalent units in ending work in process.
   Answer: TRUE
   Diff: 2
   Terms: equivalent units
   Objective: 4
   AACSB: Reflective thinking

42) In the weighted-average costing method, the costs of direct materials in beginning inventory are NOT included in the cost per unit calculation since direct materials are almost always added at the start of the production process.
   Answer: FALSE
   Explanation: The costs of the direct materials are included in the cost per unit calculation.
   Diff: 2
   Terms: weighted-average process-costing method
   Objective: 4
   AACSB: Reflective thinking

43) To calculate weighted-average conversion cost per equivalent unit, you multiply total conversion costs to date by total equivalent units of work done to date.
   Answer: FALSE
   Explanation: To calculate weighted-average conversion cost per equivalent unit, you divide total conversion costs to date by total equivalent units of work done to date.
   Diff: 2
   Terms: weighted-average process-costing method
   Objective: 4
   AACSB: Reflective thinking

44) The weighted-average cost is the total of all costs entering the Work-in-Process account (whether they are from beginning work-in-process or from work started during the current period) divided by total equivalent units of work done to date.
   Answer: TRUE
   Diff: 2
   Terms: weighted-average process-costing method
   Objective: 4
   AACSB: Reflective thinking

45) Weighted-average cost per equivalent unit is obtained by dividing the sum of costs for beginning work in process plus costs for work done in the current period by total equivalent units of work done to date.
   Answer: TRUE
   Diff: 2
   Terms: equivalent units, weighted-average process-costing method
   Objective: 4
   AACSB: Reflective thinking
46) The cost of units completed can differ materially between the weighted average and the FIFO methods of process costing.
Answer: TRUE
Diff: 2
Terms: weighted-average process-costing method, FIFO process-costing method
Objective: 4
AACSB: Reflective thinking

47) The first-in, first-out (FIFO) process costing method assigns the cost of the previous accounting period's equivalent units in beginning work-in-process inventory to the first units completed and transferred out of the process.
Answer: TRUE
Diff: 2
Terms: first-in, first-out (FIFO) process-costing method
Objective: 4
AACSB: Reflective thinking

48) A distinctive feature of the FIFO process costing method is that the work done on beginning inventory before the current period is kept separate from work done in the current period.
Answer: TRUE
Explanation: A distinctive feature of the FIFO process costing method is that the work done on beginning inventory before the current period is kept separate from work done in the current period.
Diff: 2
Terms: first-in, first-out (FIFO) process-costing method
Objective: 4
AACSB: Reflective thinking

49) In calculating cost per equivalent unit, the FIFO method of process costing merges the work and the costs of the beginning inventory with the work and the costs done during the current period.
Answer: FALSE
Explanation: In calculating cost per equivalent unit, the FIFO method of process costing only includes the work and the costs done during the current period.
Diff: 2
Terms: first-in, first-out (FIFO) process-costing method
Objective: 4
AACSB: Reflective thinking

50) The first-in, first-out process-costing method assumes that the earliest equivalent units in work in process are completed first.
Answer: TRUE
Diff: 2
Terms: first-in, first-out (FIFO) process-costing method
Objective: 4
AACSB: Reflective thinking
51) Process-costing FIFO is usually applied to both the units entering a department and the units leaving a department.
Answer: FALSE
Explanation: FIFO is only applied to the goods transferred out.
Diff: 2
Terms: first-in, first-out (FIFO) process-costing method
Objective: 4
AACSB: Reflective thinking

52) The weighted average method of process costing assigns the cost of equivalent units worked on during the current period first to complete beginning inventory, next to start and complete new units, and finally to units in ending work-in-process inventory.
Answer: FALSE
Explanation: The FIFO method of process costing assigns the cost of equivalent units worked on during the current period first to complete beginning inventory, next to start and complete new units, and finally to units in ending work-in-process inventory.
Diff: 2
Terms: process-costing system
Objective: 4
AACSB: Reflective thinking

53) A major advantage of the weighted-average process costing is that it provides managers with information about changes in the costs per unit from one period to the next.
Answer: FALSE
Explanation: This is an advantage of FIFO, not the weighted-average method.
Diff: 2
Terms: weighted-average process-costing method
Objective: 4
AACSB: Communication

54) Pet Products Company uses an automated process to manufacture its pet replica products. For June, the company had the following activities:

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning work in process inventory</td>
<td>4,500 items, 1/4 complete</td>
</tr>
<tr>
<td>Units placed in production</td>
<td>15,000 units</td>
</tr>
<tr>
<td>Units completed</td>
<td>17,500 units</td>
</tr>
<tr>
<td>Ending work in process inventory</td>
<td>2,000 items, 3/4 complete</td>
</tr>
<tr>
<td>Cost of beginning work in process</td>
<td>$5,250</td>
</tr>
<tr>
<td>Direct material costs, current</td>
<td>$16,500</td>
</tr>
<tr>
<td>Conversion costs, current</td>
<td>$23,945</td>
</tr>
</tbody>
</table>

Direct materials are placed into production at the beginning of the process and conversion costs are incurred evenly throughout the process.

**Required:**
Prepare a production cost worksheet using the FIFO method.
Answer: PRODUCTION COST WORKSHEET

<table>
<thead>
<tr>
<th>Flow of production</th>
<th>Physical Units</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>4,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Started during period</td>
<td>15,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To account for</td>
<td>19,500</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Units completed</th>
<th>Physical Units</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>4,500</td>
<td>3,375</td>
<td></td>
</tr>
<tr>
<td>Started and completed</td>
<td>13,000</td>
<td>13,000</td>
<td>13,000</td>
</tr>
<tr>
<td>Work in process, ending</td>
<td>2,000</td>
<td>2,000</td>
<td>1,500</td>
</tr>
<tr>
<td>Total</td>
<td>19,500</td>
<td>15,000</td>
<td>17,875</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Costs</th>
<th>Totals</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>$5,250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs added during period</td>
<td>40,445</td>
<td>$16,500</td>
<td>$23,945</td>
</tr>
<tr>
<td>Total costs to account for</td>
<td>$45,695</td>
<td>$16,500</td>
<td>$23,945</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td></td>
<td>15,000</td>
<td>17,875</td>
</tr>
<tr>
<td>Equivalent unit costs</td>
<td>$2.44</td>
<td>$1.10</td>
<td>$1.34</td>
</tr>
</tbody>
</table>

| Assignment of costs | | |
|---------------------|-----------------|-----------------|------------|
| Work in process, beginning | 5,250.00 | | |
| Completion of beginning (3,375 × $1.34) | 4,522.50 | | |
| Total beginning inventory | 9,772.50 | | |
| Started and Completed (13,000 × $2.44) | 31,720.00 | | |
| Total costs transferred out | $41,492.50 | | |
| Work in process, ending | | $2,200.00 | |
| Direct materials (2,000 × $1.10) | | 2,200.00 | |
| Conversion (2,000 × $1.34 × 0.75) | 2,010.00 | 4,210.00 | |
| Costs accounted for | | $45,702.50 | |

Diff: 3
Terms: first-in, first-out (FIFO) process-costing method, equivalent units
Objective: 3, 4
AACSB: Analytical skills
55) Four Seasons Company makes snow blowers. Materials are added at the beginning of the process and conversion costs are uniformly incurred. At the beginning of September, work in process is 40% complete and at the end of the month it is 60% complete. Other data for the month include:

<table>
<thead>
<tr>
<th>Description</th>
<th>Units/Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning work-in-process inventory</td>
<td>1,600 units</td>
</tr>
<tr>
<td>Units started</td>
<td>2,000 units</td>
</tr>
<tr>
<td>Units placed in finished goods</td>
<td>3,200 units</td>
</tr>
<tr>
<td>Conversion costs</td>
<td>$200,000</td>
</tr>
<tr>
<td>Cost of direct materials</td>
<td>$260,000</td>
</tr>
<tr>
<td>Beginning work-in-process costs:</td>
<td></td>
</tr>
<tr>
<td>Materials</td>
<td>$154,000</td>
</tr>
<tr>
<td>Conversion</td>
<td>$82,080</td>
</tr>
</tbody>
</table>

**Required:**

a. Prepare a production cost worksheet with supporting schedules using the weighted-average method of process costing.

b. Prepare journal entries to record transferring of materials to processing and from processing to finished goods.
## a. PRODUCTION COST WORKSHEET

<table>
<thead>
<tr>
<th>Flow of production</th>
<th>Physical Units</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>1,600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Started during period</td>
<td>2,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To account for</td>
<td>3,600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Units completed</td>
<td>3,200</td>
<td>3,200</td>
<td>3,200</td>
</tr>
<tr>
<td>Work in process, ending</td>
<td>400</td>
<td>400</td>
<td>240</td>
</tr>
<tr>
<td>Accounted for</td>
<td>3,600</td>
<td>3,600</td>
<td>3,440</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Costs</th>
<th>Totals</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>$236,080</td>
<td>$154,000</td>
<td>$82,080</td>
</tr>
<tr>
<td>Costs added during period</td>
<td>460,000</td>
<td>260,000</td>
<td>200,000</td>
</tr>
<tr>
<td>Total costs to account for</td>
<td>$696,080</td>
<td>$414,000</td>
<td>$282,080</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td>3,600</td>
<td>3,440</td>
<td></td>
</tr>
<tr>
<td>Equivalent unit costs</td>
<td>$197</td>
<td>$115</td>
<td>$82</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assignment of costs</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed units (3,200 × $197)</td>
<td>$630,400</td>
</tr>
<tr>
<td>Work in process, ending</td>
<td></td>
</tr>
<tr>
<td>Direct materials (400 × $115)</td>
<td>$46,000</td>
</tr>
<tr>
<td>Conversion (400 × $82 × 0.60)</td>
<td>19,680</td>
</tr>
<tr>
<td>Costs accounted for</td>
<td></td>
</tr>
</tbody>
</table>

b. 

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in Process</td>
<td>260,000</td>
</tr>
<tr>
<td>Materials Inventory</td>
<td>260,000</td>
</tr>
<tr>
<td>Finished Goods</td>
<td>630,400</td>
</tr>
<tr>
<td>Work in Process</td>
<td>630,400</td>
</tr>
</tbody>
</table>

Diff: 3
Terms: weighted-average process-costing method, equivalent units
Objective: 3, 4
AACSB: Analytical skills
56) Surf Products Company uses an automated process to clean and polish its souvenir items. For March, the company had the following activities:

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning work in process inventory</td>
<td>3,000 items, 1/3 complete</td>
</tr>
<tr>
<td>Units placed in production</td>
<td>12,000 units</td>
</tr>
<tr>
<td>Units completed</td>
<td>9,000 units</td>
</tr>
<tr>
<td>Ending work in process inventory</td>
<td>6,000 items, 1/2 complete</td>
</tr>
<tr>
<td>Cost of beginning work in process</td>
<td>$2,500</td>
</tr>
<tr>
<td>Direct material costs, current</td>
<td>$9,000</td>
</tr>
<tr>
<td>Conversion costs, current</td>
<td>$7,700</td>
</tr>
</tbody>
</table>

Direct materials are placed into production at the beginning of the process and conversion costs are incurred evenly throughout the process.

**Required:**
Prepare a production cost worksheet using the FIFO method.
### PRODUCTION COST WORKSHEET

#### Flow of production

<table>
<thead>
<tr>
<th></th>
<th>Physical Units</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>3,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Started during period</td>
<td>12,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To account for</td>
<td>15,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Units completed

<table>
<thead>
<tr>
<th></th>
<th>Units</th>
<th>Physical Units</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>3,000</td>
<td>2,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Started and completed</td>
<td>6,000</td>
<td>6,000</td>
<td>6,000</td>
<td></td>
</tr>
<tr>
<td>Work in process, ending</td>
<td>6,000</td>
<td>6,000</td>
<td>3,000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>15,000</td>
<td>12,000</td>
<td>11,000</td>
<td></td>
</tr>
</tbody>
</table>

#### Costs

<table>
<thead>
<tr>
<th></th>
<th>Totals</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>$2,500</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Costs added during period</td>
<td>16,700</td>
<td>$9,000</td>
<td>$7,700</td>
</tr>
<tr>
<td>Total costs to account for</td>
<td>$19,200</td>
<td>$9,000</td>
<td>$7,700</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td></td>
<td>12,000</td>
<td>11,000</td>
</tr>
<tr>
<td>Equivalent unit costs</td>
<td>$1.45</td>
<td>$0.75</td>
<td>$0.70</td>
</tr>
</tbody>
</table>

#### Assignment of costs

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Direct materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>2,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Completion of beginning</td>
<td>1,400</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total beginning inventory</td>
<td>3,900</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Started and Completed</td>
<td>8,700</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total costs transferred out</td>
<td>$12,600</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Work in process, ending</td>
<td></td>
<td>$4,500</td>
<td></td>
</tr>
<tr>
<td>Direct materials</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conversion</td>
<td>2,100</td>
<td>6,600</td>
<td></td>
</tr>
<tr>
<td>Costs accounted for</td>
<td>$19,200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Diff: 3  
Terms: first-in, first-out (FIFO) process-costing method, equivalent units  
Objective: 3, 4  
AACSB: Analytical skills
57) What is the difference between a weighted-average method of process costing and a first-in, first-out method of process costing?
Answer: The weighted average method computes unit costs by dividing total costs entering the work-in-process account (whether from beginning work-in-process or from work started during the period) by total equivalent units completed to date, and assigns this average cost to units completed and to units in ending work-in-process inventory.

The first-in, first-out (FIFO) method computes unit costs based on costs incurred during the current period and equivalent units of work done in the current period. It assigns the costs of beginning work-in-process inventory to the first units completed, and it assigns costs of the equivalent units worked on during the current period first to complete beginning inventory, next to start and complete new units, and finally to units in ending work-in-process inventory.

Diff: 3
Terms: FIFO process-costing method, weighted-average process-costing method
Objective: 4
AACSB: Reflective thinking

58) Universal Industries operates a division in Brazil, a country with very high inflation rates. Traditionally, the company has used the same costing techniques in all countries to facilitate reporting to corporate headquarters. However, the financial accounting reports from Brazil never seem to match the actual unit results of the division. Management has studied the problem and it appears that beginning inventories may be the cause of the unmatched information. The reason for this is that the inventories have a different financial base because of the severe inflation.

Required:
How can process costing assist in addressing the problem facing Universal Industries?
Answer: Probably the best way to address the problem of inflation is to use FIFO costing. This method keeps the cost of beginning inventories separate from production units started and completed in a given period. Therefore, the company may be able to track the cost of items that were actually produced in a given period, versus mixing the units and costs of multiple periods.

Diff: 2
Terms: weighted-average process-costing method, FIFO process-costing method
Objective: 4
AACSB: Multiculturalism and diversity

Objective 17.5

1) In a process-costing system when goods move from department to department, the accounting for such transfers is relatively simple under:
A) standard costing
B) FIFO costing
C) weighted-average costing
D) operations costing
Answer: A
Diff: 1
Terms: process-costing system
Objective: 5
AACSB: Reflective thinking
2) Transferred-in costs are treated as if they are:
A) conversion costs added at the beginning of the process
B) costs of beginning inventory added at the beginning of the process
C) direct labor costs added at the beginning of the process
D) a separate direct material added at the beginning of the process
Answer: D
Diff: 2
Terms: transferred-in costs
Objective: 5
AACSB: Reflective thinking

3) Ampco Disk Company operates a computer disk manufacturing plant. Direct materials are added at the end of the process. The following data were for June 20X5:

Work in process, beginning inventory 50,000 units
   Transferred-in costs (100% complete)
   Direct materials (0% complete)
   Conversion costs (90% complete)

Transferred in during current period 150,000 units
Completed and transferred out 175,000 units

Work in process, ending inventory
   Transferred-in costs (100% complete)
   Direct materials (0% complete)
   Conversion costs (65% complete)

How many units must be accounted for during the period?
A) 225,000 units
B) 200,000 units
C) 179,500 units
D) 150,000 units
Answer: B
Explanation: B) 50,000 + 150,000 = 200,000
Diff: 1
Terms: process-costing system
Objective: 5
AACSB: Analytical skills
4) Ampco Disk Company operates a computer disk manufacturing plant. Direct materials are added at the end of the process. The following data were for August 20X5:

Work in process, beginning inventory 100,000 units
Transferred-in costs (100% complete)
Direct materials (0% complete)
Conversion costs (90% complete)

Transferred in during current period 300,000 units
Completed and transferred out 250,000 units

Work in process, ending inventory 50,000 units
Transferred-in costs (100% complete)
Direct materials (0% complete)
Conversion costs (65% complete)

Calculate equivalent units for conversion costs using the FIFO method.
A) 401,500 units
B) 350,000 units
C) 300,000 units
D) 292,500 units
Answer: D
Explanation: D) Beginning work in process (100,000 × 0.10) 10,000 units
Completed and transferred out 250,000 units
Ending work in process (50,000 × 0.65) 32,500 units
292,500 units

Diff: 2
Terms: first-in, first-out (FIFO) process-costing method, equivalent units
Objective: 5
AACSB: Analytical skills

5) Transferred-in costs are incurred in previous departments that are carried forward as the product's cost as it moves to a subsequent process in the production cycle.
Answer: TRUE
Diff: 2
Terms: process-costing system, transferred-in costs
Objective: 5
AACSB: Reflective thinking

6) Transferred-in costs are treated as if they are a separate type of direct material added at the beginning of the process.
Answer: TRUE
Diff: 2
Terms: process-costing system, transferred-in costs
Objective: 5
AACSB: Reflective thinking
7) In order for a process-costing system to work, all units must be measured in the same denominations in all of the departments within the organization.
Answer: FALSE
Explanation: Units may be measured in different denominations in different departments. As units are received into a department, their measurements can be converted as needed to match the measurements used in the cost receiving department.
Diff: 2
Terms: process-costing system, transferred-in costs
Objective: 5
AACSB: Communication

8) Each department is regarded as a distinct accounting entity when interdepartmental transfers are present in an organization.
Answer: TRUE
Diff: 2
Terms: process-costing system, transferred-in costs
Objective: 5
AACSB: Reflective thinking

9) General Fabricators assembles its product in several departments. It has two departments that process all units. During October, the beginning work in process in the cutting department was half completed as to conversion, and complete as to direct materials. The beginning inventory included $12,000 for materials and $3,000 for conversion costs. Ending work-in-process inventory in the cutting department was 40% complete. Direct materials are added at the beginning of the process.

Beginning work in process in the finishing department was 75% complete as to conversion. Direct materials are added at the end of the process. Beginning inventories included $16,000 for transferred-in costs and $20,000 for conversion costs. Ending inventory was 25% complete. Additional information about the two departments follows:

<table>
<thead>
<tr>
<th></th>
<th>Cutting</th>
<th>Finishing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning work-in-process units</td>
<td>20,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Units started this period</td>
<td>40,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Units transferred this period</td>
<td>50,000</td>
<td></td>
</tr>
<tr>
<td>Ending work-in-process units</td>
<td>10,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Material costs added</td>
<td>$48,000</td>
<td>$28,000</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>$16,000</td>
<td>$40,000</td>
</tr>
<tr>
<td>Other conversion costs</td>
<td>$8,000</td>
<td>$24,000</td>
</tr>
</tbody>
</table>

**Required:**
Prepare a production cost worksheet using weighted-average for the cutting department and FIFO for the finishing department.
Flow of production

<table>
<thead>
<tr>
<th></th>
<th>Physical Units</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>20,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Started during period</td>
<td>40,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To account for</td>
<td>60,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Units transferred out</td>
<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Work in process, ending</td>
<td>10,000</td>
<td>10,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Accounted for</td>
<td>60,000</td>
<td>60,000</td>
<td>54,000</td>
</tr>
</tbody>
</table>

Costs

<table>
<thead>
<tr>
<th></th>
<th>Totals</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>$15,000</td>
<td>$12,000</td>
<td>$3,000</td>
</tr>
<tr>
<td>Costs added during period</td>
<td>72,000</td>
<td>48,000</td>
<td>24,000</td>
</tr>
<tr>
<td>Total costs to account for</td>
<td>$87,000</td>
<td>$60,000</td>
<td>$27,000</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td></td>
<td>60,000</td>
<td>54,000</td>
</tr>
<tr>
<td>Equivalent-unit costs</td>
<td>$1.50</td>
<td>$1.00</td>
<td>$0.50</td>
</tr>
</tbody>
</table>

Assignment of costs

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transferred out (50,000 × $1.50)</td>
<td></td>
<td>$75,000</td>
</tr>
<tr>
<td>Work in process, ending</td>
<td>Direct materials (10,000 × $1.00)</td>
<td>$10,000</td>
</tr>
<tr>
<td></td>
<td>Conversion (10,000 × 0.40 × $0.50)</td>
<td>2,000</td>
</tr>
<tr>
<td>Costs accounted for</td>
<td></td>
<td>$87,000</td>
</tr>
</tbody>
</table>

Diff: 3  
Terms: first-in, first-out (FIFO) process-costing method, equivalent units  
Objective: 3, 4, 5  
AACSB: Analytical skills
10) The Laramie Factory produces expensive boots. It has two departments that process all the items. During January, the beginning work in process in the tanning department was 40% complete as to conversion and 100% complete as to direct materials. The beginning inventory included $6,000 for materials and $18,000 for conversion costs. Ending work-in-process inventory in the tanning department was 40% complete. Direct materials are added at the beginning of the process.

Beginning work in process in the finishing department was 60% complete as to conversion. Beginning inventories included $7,000 for transferred-in costs and $10,000 for conversion costs. Ending inventory was 30% complete.

Additional information about the two departments follows:

<table>
<thead>
<tr>
<th></th>
<th>Tanning</th>
<th>Finishing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning work-in-process units</td>
<td>5,000</td>
<td>4,000</td>
</tr>
<tr>
<td>Units started this period</td>
<td>14,000</td>
<td>?</td>
</tr>
<tr>
<td>Units transferred this period</td>
<td>16,000</td>
<td>18,000</td>
</tr>
<tr>
<td>Ending work-in-process units</td>
<td>?</td>
<td>2,000</td>
</tr>
<tr>
<td>Material costs added</td>
<td>$18,000</td>
<td>?</td>
</tr>
<tr>
<td>Conversion costs</td>
<td>32,000</td>
<td>$19,000</td>
</tr>
<tr>
<td>Transferred-out cost</td>
<td>50,000</td>
<td>?</td>
</tr>
</tbody>
</table>

**Required:**
Prepare a production cost worksheet using weighted-average costing for the finishing department.
Answer: Production Cost Worksheet
Finishing Department
Weighted-Average Method

<table>
<thead>
<tr>
<th>Flow of production</th>
<th>Physical Units</th>
<th>Conversion</th>
<th>Trans-In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>4,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transferred in during period</td>
<td>16,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To account for</td>
<td>20,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Units transferred out</td>
<td>18,000</td>
<td>18,000</td>
<td>18,000</td>
</tr>
<tr>
<td>Work in process, ending</td>
<td>2,000</td>
<td>600</td>
<td>2,000</td>
</tr>
<tr>
<td>Accounted for</td>
<td>20,000</td>
<td>18,600</td>
<td>20,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Costs</th>
<th>Totals</th>
<th>Conversion</th>
<th>Trans-In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>$17,000</td>
<td>$10,000</td>
<td>$ 7,000</td>
</tr>
<tr>
<td>Costs added during period</td>
<td>69,000</td>
<td>19,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Total costs to account for</td>
<td>$86,000</td>
<td>$29,000</td>
<td>$57,000</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td></td>
<td>18,600</td>
<td>20,000</td>
</tr>
<tr>
<td>Equivalent-unit costs</td>
<td>$ 4.41</td>
<td>$ 1.56</td>
<td>$ 2.85</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assignment of costs</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Transferred out (18,000 × $4.41)</td>
<td></td>
<td>$79,380</td>
<td></td>
</tr>
<tr>
<td>Work in process, ending</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transferred-in costs (2,000 × $2.85)</td>
<td></td>
<td>$5,700</td>
<td></td>
</tr>
<tr>
<td>Conversion (600 × $1.56)</td>
<td></td>
<td>936</td>
<td>6,636</td>
</tr>
<tr>
<td>Costs accounted for</td>
<td></td>
<td></td>
<td>$86,016</td>
</tr>
</tbody>
</table>

Diff: 3
Terms: weighted-average process-costing method, equivalent units
Objective: 5
AACSB: Analytical skills
11) Lexington Company produces baseball bats and cricket paddles. It has two departments that process all products. During July, the beginning work in process in the cutting department was half completed as to conversion, and complete as to direct materials. The beginning inventory included $40,000 for materials and $60,000 for conversion costs. Ending work-in-process inventory in the cutting department was 40% complete. Direct materials are added at the beginning of the process.

Beginning work in process in the finishing department was 80% complete as to conversion. Direct materials for finishing the units are added near the end of the process. Beginning inventories included $24,000 for transferred-in costs and $28,000 for conversion costs. Ending inventory was 30% complete. Additional information about the two departments follows:

<table>
<thead>
<tr>
<th></th>
<th>Cutting</th>
<th>Finishing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning work-in-process units</td>
<td>20,000</td>
<td>24,000</td>
</tr>
<tr>
<td>Units started this period</td>
<td>60,000</td>
<td></td>
</tr>
<tr>
<td>Units transferred this period</td>
<td>64,000</td>
<td>68,000</td>
</tr>
<tr>
<td>Ending work-in-process units</td>
<td></td>
<td>20,000</td>
</tr>
<tr>
<td>Material costs added</td>
<td>$48,000</td>
<td>$34,000</td>
</tr>
<tr>
<td>Conversion costs</td>
<td>28,000</td>
<td>68,500</td>
</tr>
<tr>
<td>Transferred-out cost</td>
<td>128,000</td>
<td></td>
</tr>
</tbody>
</table>

**Required:**
Prepare a production cost worksheet, using FIFO for the finishing department.
**Production Cost Worksheet**  
**Finishing Department**  
**FIFO Method**

### Flow of production

<table>
<thead>
<tr>
<th></th>
<th>Physical Units</th>
<th>Direct Materials</th>
<th>Conversion</th>
<th>Trans-In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>24,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Started during period</td>
<td>64,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To account for</td>
<td>88,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Good units completed</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginning work in process</td>
<td>24,000</td>
<td>24,000</td>
<td>4,800</td>
<td></td>
</tr>
<tr>
<td>Started and completed</td>
<td>44,000</td>
<td>44,000</td>
<td>44,000</td>
<td>44,000</td>
</tr>
<tr>
<td>Ending work in process</td>
<td>20,000</td>
<td>0</td>
<td>6,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Accounted for</td>
<td>88,000</td>
<td>68,000</td>
<td>54,800</td>
<td>64,000</td>
</tr>
</tbody>
</table>

### Costs

<table>
<thead>
<tr>
<th></th>
<th>Totals</th>
<th>Direct Materials</th>
<th>Conversion</th>
<th>Trans-in</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIP, beginning</td>
<td>$52,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs added during period</td>
<td>230,500</td>
<td>$34,000</td>
<td>$68,500</td>
<td>$128,000</td>
</tr>
<tr>
<td>Total costs to account for</td>
<td>$282,500</td>
<td>$34,000</td>
<td>$68,500</td>
<td>$128,000</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td></td>
<td>68,000</td>
<td>54,800</td>
<td>64,000</td>
</tr>
<tr>
<td>Equivalent-unit costs</td>
<td>$ 3.75</td>
<td>$ 0.50</td>
<td>$ 1.25</td>
<td>$ 2.00</td>
</tr>
</tbody>
</table>

### Assignment of costs

|                     |         |                  |            |          |
| Work in process, beginning |         | $52,000         |            |          |
| Completion of beginning  |         |                  |            |          |
| Direct Materials (24,000 × $0.50) |         | $12,000         |            |          |
| Conversion (4,800 × $1.25) |         | 6,000           | $18,000    |          |
| Total Beginning Inventory |         |                 |            | 70,000   |
| Started and Completed (44,000 × $3.75) | | | | 165,000 |
| Total costs transferred out |         |                 |            | 235,000  |
| Work in process, ending  |         |                  |            |          |
| Transferred-in (20,000 × $2.00) |         | $40,000         |            |          |
| Conversion (20,000 × $1.25 × 0.30) |         | 7,500           | 47,500     |          |
| Costs accounted for     |         |                 |            | $282,500 |

**Diff:** 3  
**Terms:** first-in, first-out (FIFO) process-costing method, equivalent units  
**Objective:** 5  
**AACSB:** Analytical skills
12) When there are multiple support departments within an organization, it is common to use journal entries to transfer-in costs from one department to another. What are some of the points to remember about these costs?

Answer:
1. Be sure to include transferred-in costs from previous departments in your calculations.
2. If you are using a FIFO basis, do not overlook costs assigned in the previous period to units that were in process at the beginning of the current period but are now included in the units transferred.
3. Unit costs may fluctuate between periods, consequently, transferred units may contain batches accumulated at different unit costs.
4. Different departments may have different measurement denominations. If this is the case, as units are received in one department coming from another department, their measurements must be converted to the denomination of the receiving department.

Diff: 2
Terms: hybrid-costing system
Objective: 5
AACSB: Reflective thinking

Objective 17.6

1) An operation costing system would be applicable to:
A) batches of similar products where each batch is a variation of a single design
B) the construction of a bridge
C) a suit-making operation
D) Both A and C are correct.

Answer: D
Diff: 2
Terms: operation-costing system
Objective: 6
AACSB: Reflective thinking

2) Managers find operation costing useful in cost management because it:
A) often results in profit maximization
B) results in cost minimization
C) captures the financial impact of the control of physical processes
D) All of these answers are correct.

Answer: C
Diff: 2
Terms: operation-costing system
Objective: 6
AACSB: Reflective thinking

3) A hybrid-costing system blends characteristics from both job-costing and process costing systems.

Answer: TRUE
Diff: 2
Terms: hybrid-costing system
Objective: 6
AACSB: Reflective thinking
4) An operation-costing system is a hybrid-costing system applied to batches of similar, but NOT identical, products.
Answer: TRUE
Diff: 2
Terms: operation-costing system
Objective: 6
AACSB: Reflective thinking

5) Ford Motor Company is said to use a hybrid costing system. What is a hybrid costing system, and what would be the advantage to Ford of such a system?
Answer: A hybrid costing system is one that combines the elements of job costing and process costing systems. Important elements of profitability include knowing what the costs are, and controlling costs. Ford has a basic platform that they use to produce cars. Vehicles undergo essentially the same processing and are in effect manufactured in a continuous flow using standard parts and standardized manufacturing processes.

Another important part of profitability is making a product different than other vehicles so buyers will be attracted to purchase the vehicle. Vehicles that are different can command a higher price and increase profitability. Costs are accumulated using process costing up to the point where the product is differentiated. Job costing is used from that point forward.
Diff: 2
Terms: hybrid-costing system
Objective: 6
AACSB: Reflective thinking
Objective 17.A

Answer the following questions using the information below:

Hudson Dock Company manufactures boat docks on an assembly line. Its standard costing system uses two cost categories, direct materials and conversion costs. Each product must pass through the Assembly Department and the Finishing Department. Direct materials are added at the beginning of the production process. Conversion costs are allocated evenly throughout production.

Data for the Assembly Department for May 20X5 are:

Work in process, beginning inventory: 70 units
- Direct materials (100% complete)
- Conversion costs (25% complete)

Units started during May 40 units

Work in process, ending inventory: 10 units
- Direct materials (100% complete)
- Conversion costs (50% complete)

Costs for May:
- Standard costs for Assembly:
  - Direct materials $4,000 per unit
  - Conversion costs $16,000 per unit

Work in process, beginning inventory:
- Direct materials $140,000
- Conversion costs $260,000

1) What is the balance in ending work-in-process inventory?
A) $82,000
B) $120,000
C) $155,000
D) $170,000
Answer: B
Explanation: B) 10 units × $4,000 = $40,000
10 units × 50% × $16,000 = 80,000
  $120,000

Diff: 3
Terms: process-costing system
Objective: A
AACSB: Analytical skills
2) Which of the following journal entries records the Assembly Department's conversion costs for the month, assuming conversion costs are 20% higher than expected?

A) Assembly Department Conversion Cost Control 1,680,000
   Various accounts 1,680,000
B) Materials Inventory 1,680,000
   Assembly Department Conversion Cost Control 1,680,000
C) Assembly Department Conversion Cost Control 1,400,000
   Materials Inventory 1,400,000
D) Materials Inventory 1,680,000
   Work in Process  Assembly 1,680,000

Answer: A

Explanation:

A) 70 units x 75% × $16,000 = 840,000
   (40 - 10 units) × $16,000 = 480,000
   10 units x 50% × $16,000 = 80,000
   Budgeted $1,400,000

$1,400,000 × 1.20% = $1,680,000

Diff: 3
Terms: process-costing system
Objective: A
AACSB: Analytical skills

3) Which of the following journal entries properly records the assignment of conversion costs to work-in-process inventory and the conversion-cost variances of the Assembly Department, assuming that conversion costs are 20% higher than expected?

A) Work in Process  Assembly 1,680,000
   Conversion-Cost Variances 280,000
   Assembly Department Conversion Cost Control 1,400,000
B) Work in Process  Assembly 1,680,000
   Direct Materials Variances 280,000
   Testing Department Conversion Cost Control 1,400,000
C) Work in Process  Assembly 1,400,000
   Conversion-Cost Variances 280,000
   Assembly Department Conversion Cost Control 1,680,000
D) Work in Process  Testing 1,400,000
   Assembly Department Conversion Cost Control 1,400,000

Answer: C

Explanation:

C) 70 units x 75% × $16,000 = 840,000
   (40 - 10 units) × $16,000 = 480,000
   10 units x 50% × $16,000 = 80,000
   Budgeted $1,400,000

$1,400,000 × 1.20% = $1,680,000

$1,680,000 - $1,400,000 = $280,000 conversion cost variances
4) Which of the following journal entries properly records direct materials requisitions for the work-in-process inventory and direct materials variances, assuming that the Assembly Department used 10% less materials than expected?

A) Work in Process  Assembly  160,000
   Assembly Department Materials Cost Control  160,000

B) Work in Process  Assembly  160,000
   Direct Materials Variance  16,000
   Assembly Department Materials Cost Control  144,000

C) Work in Process  Assembly  144,000
   Assembly Department Materials Cost Control  144,000

D) Work in Process  Assembly  144,000
   Direct Materials Variances  16,000
   Assembly Department Materials Cost Control  160,000

Answer:  B

Explanation:  B) 40 × $4,000 = $160,000
$160,000 × 0.9 = $144,000

Diff: 2
Terms: process-costing system
Objective: A
AACSB: Reflective thinking
Answer the following questions using the information below:

Lehman Pottery Company manufactures clay molded pottery on an assembly line. Its standard costing system uses two cost categories, direct materials and conversion costs. Each product must pass through the Assembly Department and the Finishing Department. Direct materials are added at the beginning of the production process. Conversion costs are allocated evenly throughout production.

Data for the Assembly Department for August 2008 are:

- Work in process, beginning inventory: 800 units
  - Direct materials (100% complete)
  - Conversion costs (40% complete)
- Units started during August: 450 units
- Work in process, ending inventory: 300 units
  - Direct materials (100% complete)
  - Conversion costs (60% complete)

Costs for August:

- Standard costs for Assembly:
  - Direct materials: $30 per unit
  - Conversion costs: $55 per unit
- Work in process, beginning inventory:
  - Direct materials: $22,000
  - Conversion costs: $16,500

5) What is the balance in ending work-in-process inventory?

A) $25,500  
B) $38,500  
C) $15,600  
D) $18,900  
Answer: D  
Explanation:  
D) 300 units × $30 = $9,000  
300 units × 60% × $55 = 9,900  
$18,900

Diff: 3  
Terms: process-costing system  
Objective: A  
AACSB: Analytical skills
6) Which of the following journal entries records the Assembly Department's conversion costs for the month, assuming conversion costs are 10% higher than expected?

A) Assembly Department Conversion Cost Control 39,325
   Various accounts 39,325

B) Materials Inventory 39,325
   Assembly Department Conversion Cost Control 39,325

C) Assembly Department Conversion Cost Control 49,005
   Various accounts 49,005

D) Materials Inventory 49,005
   Work in Process Assembly 49,005

Answer: C

Explanation:

C) 800 units x 60% × $55 = $26,400
   (450 - 300 units) × $55 = 8,250
   300 units x 60% × $55 = 9,900
   Budgeted $44,550

$44,550 × 1.10% = $49,005

Diff: 3
Terms: process-costing system
Objective: A
AACSB: Analytical skills

7) Standard costing is extremely useful when unique, high cost products are produced, as compared to the production of multiple products.

Answer: FALSE

Explanation: Job costing is especially useful in this situation.

Diff: 2
Terms: process-costing system
Objective: A
AACSB: Reflective thinking

8) Under standard costing the cost per equivalent-unit calculation is more difficult than in either weighted average or FIFO.

Answer: FALSE

Explanation: The cost per equivalent-unit calculation is simpler because the cost is assumed constant during the accounting period.

Diff: 2
Terms: equivalent units, FIFO and weighted-average process-costing method
Objective: A
AACSB: Reflective thinking

9) Standard costing is NOT possible in a firm that uses process costing.

Answer: FALSE

Explanation: Standard costing is possible in a firm that uses process costing.

Diff: 2
Terms: process costing
Objective: A
AACSB: Reflective thinking
10) Companies that use process-costing systems will incur variances if they do NOT incorporate the use of the standard-costing method.
Answer:  FALSE
Explanation: Variances arise under standard costing because the standard costs assigned to products on the basis of work done in the current period do not equal actual costs incurred in the period.
Diff: 2
Terms:  process costing
Objective:  A
AACSB:  Reflective thinking

11) In companies that produce masses of identical or similar units of output and consequently use process-costing systems, it is relatively easy to set standards and use a standard cost as the cost per equivalent unit.
Answer:  TRUE
Diff: 2
Terms:  process costing
Objective:  A
AACSB:  Reflective thinking

12) BIG Manufacturing Products has been using FIFO process costing for tracking the costs of its manufacturing activities. However, in recent months, the system has become somewhat bogged down with details. It seems that, when the company purchased Brown Electronics last year, its product lines increased six-fold. This has caused both the accountants and the suppliers of the information, the line managers, great difficulty in keeping the costs of each product line separate. Likewise, the estimation of the completion of ending work-in-process inventories and the associated costs has become very cumbersome. The chief financial officer of the company is looking for ways to improve the reporting system of product costs.

Required:
What can you recommend to improve the situation?
Answer:  A beginning point would be to change to a standard costing system. Standard costing eliminates many of the problems of FIFO costing in tracking actual costs to products. With standard costing, only the equivalent units have to be determined immediately, not the actual cost of the period. A standard cost for materials and conversion is then applied to the equivalent units for the reporting period. Actual costs and variances from standard costing can be determined later. This approach is very appropriate for a company that has many products.
Diff: 3
Terms:  first-in, first-out (FIFO) process-costing method
Objective:  4, A
AACSB:  Analytical skills
Objective 18.1

1) Managers often cite reductions in the costs of spoilage as a(n):
A) major justification for implementing a just-in-time production system
B) measurement of improved output quality
C) immaterial item that is not to be tracked
D) indication of improvement in the accounting system
Answer: A
Diff: 2
Terms: spoilage
Objective: 1
AACSB: Analytical skills

2) Unacceptable units of production that are discarded or sold for reduced prices are referred to as:
A) reworked units
B) spoilage
C) scrap
D) defective units
Answer: B
Diff: 1
Terms: spoilage
Objective: 1
AACSB: Ethical reasoning

3) Unacceptable units of production that are subsequently repaired and sold as acceptable finished goods are:
A) reworked units
B) spoilage
C) scrap
D) defective units
Answer: A
Diff: 1
Terms: rework
Objective: 1
AACSB: Reflective thinking

4) Costs of poor quality production include the:
A) opportunity cost of the plant and workers
B) effect on current customers
C) effect on potential customers
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: spoilage
Objective: 1
AACSB: Reflective thinking
5) Material left over when making a product is referred to as:
A) reworked units
B) spoilage
C) scrap
D) defective units
Answer: C
Diff: 1
Terms: scrap
Objective: 1
AACSB: Reflective thinking

6) A production process which involves spoilage and rework occurs in:
A) the manufacture of high precision tools
B) semiconductor units
C) the manufacture of clothing
D) All of these answers are correct.
Answer: A
Diff: 2
Terms: spoilage, rework
Objective: 1
AACSB: Reflective thinking

7) Some amounts of spoilage, rework, or scrap are inherent in many production processes.
Answer: TRUE
Diff: 2
Terms: spoilage
Objective: 1
AACSB: Analytical skills

8) An item classified as spoilage has no value.
Answer: FALSE
Explanation: Although the item does not meet the specifications, it may be sold as a "second" or for its scrap value. It is not necessarily thrown out.
Diff: 2
Terms: spoilage
Objective: 1
AACSB: Analytical skills

9) Reworked goods are unacceptable units of production usually NOT capable of being repaired or converted into a salable product.
Answer: FALSE
Explanation: Rework is units of production that do not meet the specifications required by customers but that are subsequently repaired and sold as good finished units.
Diff: 2
Terms: rework
Objective: 1
AACSB: Ethical reasoning
10) Rework is finished production that is NOT in accordance with customer desires. The product is redone and sold as finished goods.
Answer: TRUE
Diff: 2
Terms: rework
Objective: 1
AACSB: Ethical reasoning

11) Scrap is residual material that results from manufacturing a product and can have either a high or low sales value relative to the product with which it is associated.
Answer: FALSE
Explanation: Scrap is residual material that results from manufacturing a product. Examples are short lengths from woodworking operations, edges from plastic molding operations, and frayed cloth and end cuts from suit-making operations. Scrap can sometimes be sold for relatively small amounts.
Diff: 2
Terms: scrap
Objective: 1
AACSB: Analytical skills

12) Scrap and rework are considered to be the same thing by managerial accountants.
Answer: FALSE
Explanation: Scrap and rework are not considered to be the same thing by managerial accountants.
Diff: 2
Terms: scrap, rework
Objective: 1
AACSB: Analytical skills

13) Distinguish among spoilage, reworked units, and scrap. Give an example of each.
Answer: Spoilage refers to unacceptable units of production that are discarded or are sold for reduced prices. Both partially completed or fully completed units of output can be spoiled. Examples are defective clothes sold as seconds.

Reworked units are unacceptable units of production that are subsequently repaired and sold as acceptable finished goods. Defective units of product (such as pagers, computer disk drives, computers, and telephones) detected during production or immediately after production but before units are shipped to customers, can sometimes be reworked and sold as good products.

Scrap is material left over when making a product. It has low sales value compared with the sales value of the product. Examples are shavings and short lengths from woodworking operations and edges left over from plastic molding operations.
Diff: 1
Terms: spoilage, rework, scrap
Objective: 1
AACSB: Reflective thinking
14) For each of the following items identify whether it is spoilage, reworked units, or scrap.

   ______ a. Defective jeans sold as seconds
   ______ b. Shavings
   ______ c. Edges from plastic moldings
   ______ d. Carpets sold as seconds
   ______ e. Precision tools that are not built successfully to the necessary tolerance, but which can be successfully converted to a saleable product
   ______ f. Rock extracted as a result of mining processing
   ______ g. Complex defective products such as semiconductors

Answer:
   a. spoilage
   b. scrap
   c. scrap
   d. spoilage
   e. spoilage and rework
   f. scrap
   g. spoilage (usually too complex to rework)

Diff: 2
Terms: spoilage, rework, scrap
Objective: 1
AACSB: Ethical reasoning

Objective 18.2

1) Spoilage that is an inherent result of the particular production process and arises under efficient operating conditions is referred to as:
   A) ordinary spoilage
   B) normal spoilage
   C) abnormal spoilage
   D) None of these answers is correct.

Answer: B

Diff: 2
Terms: normal spoilage
Objective: 2
AACSB: Reflective thinking

2) Spoilage that should NOT arise under efficient operating conditions is referred to as:
   A) ordinary spoilage
   B) normal spoilage
   C) abnormal spoilage
   D) None of these answers is correct.

Answer: C

Diff: 2
Terms: abnormal spoilage
Objective: 2
AACSB: Reflective thinking
3) Costs of normal spoilage are usually accounted for as:
A) part of the cost of goods sold
B) part of the cost of goods manufactured
C) a separate line item in the income statement
D) an asset in the balance sheet
Answer: B
Diff: 2
Terms: normal spoilage
Objective: 2
AACSB: Reflective thinking

4) Costs of abnormal spoilage are usually accounted for as:
A) part of the cost of goods sold
B) part of the cost of goods manufactured
C) a separate line item in the income statement
D) an asset in the balance sheet
Answer: C
Diff: 2
Terms: abnormal spoilage
Objective: 2
AACSB: Reflective thinking

5) The loss from abnormal spoilage account would appear:
A) on the balance sheet
B) as a detailed item in the retained earnings schedule of the balance sheet
C) as a detailed item on the income statement
D) Either A or B is correct.
Answer: C
Diff: 2
Terms: abnormal spoilage
Objective: 2
AACSB: Analytical skills

6) Normal spoilage should be computed using as the base the:
A) total units completed
B) total good units completed
C) total actual units started into production
D) None of these answers is correct.
Answer: B
Diff: 2
Terms: normal spoilage
Objective: 2
AACSB: Analytical skills
7) Companies that attempt to achieve zero defects in the manufacturing process treat spoilage as:
A) scrap  
B) reworked units  
C) abnormal spoilage  
D) normal spoilage  
Answer: C  
Diff: 2  
Terms: abnormal spoilage  
Objective: 2  
AACSB: Ethical reasoning

8) Which one of the following conditions usually exists when comparing normal and abnormal spoilage to controllability?

<table>
<thead>
<tr>
<th>Normal Spoilage</th>
<th>Abnormal Spoilage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Controllable</td>
<td>Controllable</td>
</tr>
<tr>
<td>B) Controllable</td>
<td>Uncontrollable</td>
</tr>
<tr>
<td>C) Uncontrollable</td>
<td>Uncontrollable</td>
</tr>
<tr>
<td>D) Uncontrollable</td>
<td>Controllable</td>
</tr>
</tbody>
</table>
Answer: D  
Diff: 2  
Terms: normal spoilage, abnormal spoilage  
Objective: 2  
AACSB: Reflective thinking

9) NOT counting spoiled units in the equivalent-unit calculation results in:
A) lower cost per good unit.  
B) higher cost per good unit  
C) better management information  
D) Both A and C are correct.  
Answer: B  
Diff: 2  
Terms: spoilage  
Objective: 2  
AACSB: Analytical skills

10) Recognition of spoiled units when computing output units:
A) highlights the costs of normal spoilage to management  
B) distorts the accounting data  
C) focuses management's attention on reducing spoilage  
D) Both A and C are correct.  
Answer: D  
Diff: 2  
Terms: spoilage, normal spoilage  
Objective: 2  
AACSB: Communication
11) The costs of normal spoilage are typically included as a component of the costs of good units manufactured.
Answer: TRUE
Diff: 2
Terms: normal spoilage
Objective: 2
AACSB: Analytical skills

12) Abnormal spoilage is spoilage inherent in a particular production process.
Answer: FALSE
Explanation: Normal spoilage is spoilage inherent in a particular production process.
Diff: 2
Terms: normal spoilage
Objective: 2
AACSB: Analytical skills

13) Abnormal spoilage is spoilage that should arise under efficient operating conditions.
Answer: FALSE
Explanation: Abnormal spoilage should not arise under efficient operating conditions.
Diff: 2
Terms: abnormal spoilage
Objective: 2
AACSB: Analytical skills

14) Companies calculate the units of abnormal spoilage and record the cost in the Loss from Abnormal Spoilage account, which appears as a separate line item in the income statement.
Answer: TRUE
Diff: 2
Terms: abnormal spoilage
Objective: 2
AACSB: Ethical reasoning

15) Spoilage can be considered either normal or abnormal.
Answer: TRUE
Diff: 2
Terms: spoilage
Objective: 2
AACSB: Ethical reasoning

16) Normal spoilage is spoilage that is NOT considered to be inherent in a production process.
Answer: FALSE
Explanation: Normal spoilage is spoilage that is considered to be inherent in a production process.
Diff: 1
Terms: normal spoilage
Objective: 2
AACSB: Analytical skills
17) Under efficient operating conditions, all spoilage is considered to be abnormal spoilage.
Answer: FALSE
Explanation: Normal spoilage is spoilage that is considered to be inherent in a production process. It arises even when the process is operated in an efficient manner.
Diff: 1
Terms: normal spoilage
Objective: 2
AACSB: Ethical reasoning

18) Normal spoilage rates are computed by dividing units of normal spoilage by total good units completed, NOT total actual units started in production.
Answer: TRUE
Diff: 2
Terms: normal spoilage
Objective: 2
AACSB: Analytical skills

19) A company might consider all spoilage to be abnormal if it wants to pay serious attention to the problem.
Answer: TRUE
Diff: 2
Terms: abnormal spoilage
Objective: 2
AACSB: Ethical reasoning

20) Costs of abnormal spoilage are separately accounted for as losses of the period.
Answer: TRUE
Diff: 2
Terms: abnormal spoilage
Objective: 2
AACSB: Analytical skills

21) What are the objectives in accounting for spoilage?
Answer: The key objectives in accounting for spoilage are determining the magnitude of the costs of the spoilage and distinguishing between the costs of normal and abnormal spoilage. To effectively manage a company (or a division of a business), a manager needs information concerning how his business is performing. Spoilage is a cost which should be controlled and minimized. The dimensions of the cost must be known (the dollar amount of the spoilage). The accounting system must be capable of determining the dollar amount of the spoilage costs while distinguishing between normal and abnormal spoilage. This information must be reported and available to management on a timely basis.
Diff: 2
Terms: spoilage
Objective: 2
AACSB: Reflective thinking

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22) The Joe's Pottery manufactures pottery products. All direct materials are included at the inception of the production process. For April, there was no beginning inventory in the processing plant. Direct materials totaled $155,000 for the month. Work-in-process records revealed that 2,500 tons were started in April and that 1,500 tons were finished; 500 tons were spoiled as expected. Ending work-in-process units are complete in respect to direct materials costs. Spoilage is not detected until the process is complete.

**Required:**

a. What is the cost per equivalent unit if spoiled units are recognized or ignored?
b. What are the costs assigned to completed units when spoilage units are recognized or when they are not recognized?
c. What are the costs transferred out if spoilage units are recognized or ignored?
d. What are the amounts allocated to the work-in-process ending inventory when spoilage units are recognized or ignored?

**Answer:**

a.  

<table>
<thead>
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<tbody>
<tr>
<td>Cost to account for</td>
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<td>Divided by equivalent units</td>
<td>2,500</td>
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<tr>
<td>Cost per equivalent unit</td>
<td><strong>$62</strong></td>
<td><strong>$77.50</strong></td>
</tr>
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</table>

b.  

Assigned to good units completed:

- (1,500 × $62) $93,000
- (1,500 × $77.50) $116,250

c.  

Transferred out  

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<tr>
<td>Finished</td>
<td>$93,000</td>
<td>$116,250</td>
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<tr>
<td>Normal spoilage (500 × $62)</td>
<td>31,000</td>
<td>0</td>
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<tr>
<td>Total</td>
<td><strong>$124,000</strong></td>
<td><strong>$116,250</strong></td>
</tr>
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</table>

d.  

Ending work-in-process inventory:

- (500 × $62) $31,000
- (500 × $77.50) $38,750

**Diff:** 2

**Terms:** spoilage

**Objective:** 2

**AACSB:** Analytical skills
Objective 18.3

Answer the following questions using the information below:

Triboro Computer Systems, Inc., manufactures printer circuit cards. All direct materials are added at the inception of the production process. During January, the accounting department noted that there was no beginning inventory. Direct materials purchases totaled $200,000 during the month. Work-in-process records revealed that 8,000 card units were started in January, 4,000 card units were complete, and 3,000 card units were spoiled as expected. Ending work-in-process card units are complete in respect to direct materials costs. Spoilage is not detected until the process is complete.

1) What are the respective direct material costs per equivalent unit, assuming spoiled units are recognized or ignored?
   A) $20.00; $35.00
   B) $25.00; $40.00
   C) $30.00; $45.00
   D) $35.00; $50.00

   Answer: B

   Explanation:

   

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<tr>
<td>Divided by equivalent units</td>
<td>8,000</td>
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<tr>
<td>Cost per equivalent unit</td>
<td>$25.00</td>
<td>(1)</td>
<td>$40.00</td>
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</tbody>
</table>

   Assigned to:

   Good units completed
   (4,000 × $25; $40) $ 100,000 $ 160,000

   Normal spoilage
   (3,000× $25) 75,000 0

   Costs transferred out
   175,000 (2/3) 160,000

   WIP ending inventory (1,000 × $25; $40) 25,000 (4) 40,000

   Cost accounted for: $200,000 $200,000

   Diff: 2

   Terms: spoilage

   Objective: 3

   AACSB: Analytical skills
2) What is the direct material cost assigned to good units completed when spoilage units are recognized?  

A) $100,000  
B) $200,000  
C) $160,000  
D) $175,000  

Answer: D  

Explanation:  
D) Calculation for  

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<td>5,000</td>
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<tr>
<td>Cost per equivalent unit</td>
<td>$25.00</td>
<td>(1)</td>
<td>$40.00</td>
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Assigned to:  

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<th>Good units completed</th>
<th>Normal spoilage</th>
<th>Costs transferred out</th>
<th>WIP ending inventory</th>
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<tr>
<td></td>
<td>(4,000 \times $25; $40)</td>
<td>(3,000 \times $25)</td>
<td>175,000 (2/3)</td>
<td>25,000 (4)</td>
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<tr>
<td></td>
<td>$100,000</td>
<td>75,000</td>
<td>160,000</td>
<td>40,000</td>
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Cost accounted for:  

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<th>Recognized</th>
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</tr>
</thead>
<tbody>
<tr>
<td>$200,000</td>
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<td></td>
</tr>
</tbody>
</table>

Diff: 3  
Terms: spoilage  
Objective: 3  
AACSB: Analytical skills
3) What is the cost transferred out assuming spoilage units are ignored?
A) $175,000
B) $160,000
C) $100,000
D) $155,000
Answer: B
Explanation:

\[ \text{Calculation for} \]

\[ \begin{array}{c|c|c}
\text{Recognized} & \text{Problem #} & \text{Ignored} \\
\hline
\text{Cost to account for:} & $200,000 & $200,000 \\
\text{Divided by equivalent units} & 8,000 & 5,000 \\
\text{Cost per equivalent unit} & \$25.00 & (1) \$40.00 \\
\hline
\text{Assigned to:} & & \\
\text{Good units completed} & & \\
\quad (4,000 \times \$25; \$40) & \$100,000 & \$160,000 \\
\text{Normal spoilage} & & \\
\quad (3,000 \times \$25) & 75,000 & 0 \\
\text{Costs transferred out} & 175,000 & (2/3) 160,000 \\
\text{WIP ending inventory} & 25,000 & (4) 40,000 \\
\text{Cost accounted for:} & $200,000 & $200,000 \\
\text{Diff:} & 3 \\
\text{Terms:} & \text{spoilage} \\
\text{Objective:} & 3 \\
\text{AACSB:} & \text{Analytical skills} \end{array} \]
4) What are the amounts allocated to the work-in-process ending inventory assuming spoilage units are recognized and ignored, respectively?

A) $40,000; $49,000
B) $60,000; $68,500
C) $25,000; $40,000
D) $75,000; $80,000

Answer: C

Explanation:
C)

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<td>5,000</td>
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</tr>
<tr>
<td>Cost per equivalent unit</td>
<td>$25.00</td>
<td>(1)</td>
<td>$40.00</td>
</tr>
</tbody>
</table>

Assigned to:

- Good units completed:
  - $(4,000 \times $25; $40) $100,000 $160,000
  - Normal spoilage $(3,000 \times $25) 75,000 0

Costs transferred out:

- 175,000 (2/3) 160,000
- WIP ending inventory $(1,000 \times $25; $40) 25,000 (4) 40,000

Cost accounted for:

- $200,000 $200,000

Diff: 3

Terms: spoilage
Objective: 3
AACSB: Analytical skills
5) Spoilage costs allocated to ending work in process are larger by which method and by how much?
A) when spoiled units are recognized, by $5,000
B) when spoiled units are recognized, by $8,500
C) when spoiled units are ignored, by $15,000
D) when spoiled units are recognized, by $15,000
Answer: C
Explanation:

| Calculation for |
|-----------------|-----------------|
| Recognized      | Problem #       | Ignored            |
| Cost to account for: | $200,000       | $200,000           |
| Divided by equivalent units | 8,000          | 5,000              |
| Cost per equivalent unit | $ 25.00       | (1)                | $ 40.00                |

Assigned to:

| Good units completed | $100,000 | $160,000 |
| Normal spoilage      | 75,000   | 0        |
| Costs transferred out| 175,000  | (2/3) 160,000 |
| WIP ending inventory | 25,000   | (4) 40,000  |

Cost accounted for: $200,000 $200,000

$40,000 - $25,000 = $15,000 or $15.00 ∗ 1,000 units = 15,000

Diff: 3

Terms: spoilage
Objective: 3
AACSB: Reflective thinking
Answer the following questions using the information below:

Craft Concept manufactures small tables in its Processing Department. Direct materials are added at the initiation of the production cycle and must be bundled in single kits for each unit. Conversion costs are incurred evenly throughout the production cycle. Before inspection, some units are spoiled due to nondetectible materials defects. Inspection occurs when units are 50% converted. Spoiled units generally constitute 5% of the good units. Data for December 2012 are as follows:

WIP, beginning inventory 12/1/2012 20,000 units
   Direct materials (100% complete)
   Conversion costs (75% complete)

Started during December 80,000 units
Completed and transferred out 12/31/2012 76,800 units
WIP, ending inventory 12/31/2012 16,000 units
   Direct materials (100% complete)
   Conversion costs (65% complete)

Costs for December:
   WIP, beginning Inventory:
      Direct materials $ 100,000
      Conversion costs 60,000
   Direct materials added 200,000
   Conversion costs added 280,000

6) What is the number of total spoiled units?
A) 13,200 units
B) 4,000 units
C) 5,400 units
D) 7,200 units
Answer:  D
Explanation:  D) Spoiled units = (20,000 units + 80,000) - (76,800 units + 16,000) = 7,200 units
Diff: 2
Terms:  spoilage
Objective:  3
AACSB:  Analytical skills

7) Normal spoilage totals:
A) 3,200 units
B) 4,000 units
C) 3,840 units
D) 5,400 units
Answer:  C
Explanation:  C) Normal spoilage = 5% × 76,800 units = 3,840 spoiled units
Diff: 2
Terms:  normal spoilage
Objective:  3
AACSB:  Analytical skills
8) Abnormal spoilage totals:
A) 3,200 units
B) 4,000 units
C) 3,360 units
D) 3,840 units
Answer: C
Explanation: C) Spoiled units = (20,000 units + 80,000) - (76,800 units +16,000) = 7,200 units
Normal spoilage = 5% × 76,800 units = 3,840 spoiled units
Abnormal spoilage = 7,200 units - 3,840 units = 3,360 units
Diff: 3
Terms: abnormal spoilage
Objective: 3
AACSB: Analytical skills

9) What is the total cost per equivalent unit using the weighted-average method of process costing?
A) $3.00
B) $3.60
C) $6.60
D) $4.60
Answer: C
Explanation: C)  

<table>
<thead>
<tr>
<th></th>
<th>Direct Materials</th>
<th>Conversion Costs</th>
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<tbody>
<tr>
<td>WIP, beginning inventory</td>
<td>$ 100,000</td>
<td>$ 60,000</td>
</tr>
<tr>
<td>Costs added during period</td>
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<td>Divide by equivalent units</td>
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<td>94,400</td>
</tr>
<tr>
<td>Equivalent-unit costs</td>
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<td>$ 3.60</td>
</tr>
</tbody>
</table>

Total cost per equivalent unit = $3.00 + $3.60 = $6.60
Diff: 2
Terms: spoilage, weighted-average method
Objective: 3
AACSB: Analytical skills
10) What cost is allocated to abnormal spoilage using the weighted-average process-costing method?
A) $0
B) $14,720
C) $22,176
D) $32,800
Answer: C
Explanation: C) Spoiled units = (20,000 units + 80,000) - (76,800 units + 16,000) = 7,200 units
Normal spoilage = 5% × 76,800 units = 3,840 spoiled units
Abnormal spoilage = 7,200 units - 3,840 units = 3,360 units

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<tr>
<td>Equivalent-unit costs</td>
<td>$3.00</td>
<td>$3.60</td>
</tr>
</tbody>
</table>

Total cost per equivalent unit = $3.00 + $3.60 = $6.60
3,360 units × $6.60 = $22,176

Diff: 2
Terms: abnormal spoilage, weighted-average method
Objective: 3
AACSB: Analytical skills

11) What are the amounts of direct materials and conversion costs assigned to ending work in process using the weighted-average process-costing method?
A) $37,440; $48,000
B) $45,800; $39,640
C) $48,000; $37,440
D) $57,120; $28,320
Answer: C
Explanation: C) Direct Materials Conversion Costs
WIP, beginning inventory $100,000 $60,000
Costs added during period 200,000 280,000
Total cost to account for 300,000 340,000
Divide by equivalent units 100,000 94,400
Equivalent-unit costs $3.00 $3.60

Total cost per equivalent unit = $3.00 + $3.60 = $6.60
Direct materials = 16,000 units × $3.00 = $48,000
Conversion costs = 10,400 units × $3.60 = $37,440

Diff: 2
Terms: spoilage, weighted-average method
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

Fish Fillet Incorporated obtains fish and then processes them into frozen fillets and then prepares the frozen fish fillets for distribution to its retail sales department. Direct materials are added at the initiation of the cycle. Conversion costs are incurred evenly throughout the production cycle. Before inspection, some fillets are spoiled due to nondetectible defects. Inspection occurs when units are 50% converted. Spoiled fillets generally constitute 3.5% of the good fillets. Data for April 2012 are as follows:

WIP, beginning inventory 4/1/2012 80,000 fillets
   Direct materials (100% complete) $ 110,000
   Conversion costs (50% complete) 80,000
Started during April 150,000 fillets
Completed and transferred out 4/31/2012 200,000 fillets
WIP, ending inventory 4/31/2012 16,000 fillets
   Direct materials (100% complete) 290,200
   Conversion costs (20% complete) 376,130

Costs for April:
   WIP, beginning Inventory:
      Direct materials $ 110,000
      Conversion costs 80,000
   Direct materials added 290,200
   Conversion costs added 376,130

12) What is the number of total spoiled units?
   A) 16,000 units
   B) 10,000 units
   C) 50,000 units
   D) 14,000 units
   Answer:  D
   Diff: 2
   Terms: spoilage
   Objective: 3
   AACSB: Analytical skills

13) Normal spoilage totals:
   A) 7,000 units
   B) 0 units
   C) 16,000 units
   D) 14,000 units
   Answer: A
   Explanation: A) Normal spoilage = 3.5% × 200,000 units = 7,000 spoiled units
   Diff: 2
   Terms: normal spoilage
   Objective: 3
   AACSB: Analytical skills
14) Abnormal spoilage totals:
A) 7,000 units  
B) 0 units  
C) 16,000 units  
D) 14,000 units
Answer: A
Explanation: A) Spoiled units = (80,000 units + 150,000) - (200,000 units + 16,000 units) = 14,000 units
Normal spoilage = 3.5% × 200,000 units = 7,000 spoiled units
Abnormal spoilage = 14,000 units - 7,000 units = 7,000 units
Diff: 3
Terms: abnormal spoilage
Objective: 3
AACSB: Analytical skills

15) What is the total cost per equivalent unit using the weighted-average method of process costing?
A) $4.00  
B) $1.74  
C) $2.10  
D) $3.84
Answer: D
Explanation: D)  
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<th>Conversion Costs</th>
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<td>$ 110,000</td>
<td>$ 80,000</td>
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<td>Costs added during period</td>
<td>290,200</td>
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<tr>
<td>Total cost to account for</td>
<td>400,200</td>
<td>456,130</td>
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<td>Divide by equivalent units</td>
<td>230,000</td>
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<tr>
<td>Equivalent-unit costs</td>
<td>$ 1.74</td>
<td>$ 2.10</td>
</tr>
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</table>

Total cost per equivalent unit = $1.74 + $2.10 = $3.84
Diff: 2
Terms: spoilage, weighted-average method
Objective: 3
AACSB: Analytical skills
16) What cost is allocated to abnormal spoilage using the weighted-average process-costing method?
A) $ 0  
B) $26,880  
C) $53,760  
D) $29,000  
Answer: B

Explanation: B) Spoiled units = (80,000 units + 150,000) - (200,000 units + 16,000 units) = 14,000 units 
Normal spoilage = 3.5% × 200,000 units = 7,000 spoiled units 
Abnormal spoilage = 14,000 units - 7,000 units = 7,000 units 

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<thead>
<tr>
<th>WIP, beginning inventory</th>
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<th>$110,000</th>
<th>Conversion Costs</th>
<th>$80,000</th>
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<tr>
<td>Divide by equivalent units</td>
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<td>Equivalent-unit costs</td>
<td>$1.74</td>
<td>$2.10</td>
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Total cost per equivalent unit = $1.74 + $2.10 = $3.84 
7,000 units × $3.84 = $26,880 
Diff: 2 
Terms: abnormal spoilage, weighted-average method 
Objective: 3 
AACSB: Analytical skills

17) What are the amounts of direct materials and conversion costs assigned to ending work in process using the weighted-average process-costing method?
A) $6,720; $27,840  
B) $27,840 $6,720  
C) $27,840; $33,600  
D) $33,600; $27,840  
Answer: B

Explanation: B) Direct Materials | Conversion Costs 
WIP, beginning inventory | $110,000 | $80,000 |
Costs added during period | 290,200 | 376,130 |
Total cost to account for | 400,200 | 456,130 |
Divide by equivalent units | 230,000 | 217,200 |
Equivalent-unit costs | $1.74 | $2.10 |

Total cost per equivalent unit = $1.74 + $2.10 = $3.84 
Direct materials = 16,000 units × $1.74 = $27,840 
Conversion costs = 16,000 units × 20% × $2.10 = $6,720 
Diff: 2 
Terms: spoilage, weighted-average method 
Objective: 3 
AACSB: Analytical skills
18) The cost per good unit in the weighted-average method is equal to the:
   A) total cost of direct materials and conversion costs per equivalent unit, plus a share of normal spoilage
   B) sum of the costs per equivalent unit of direct materials, and conversion costs
   C) total costs divided by total equivalent units
   D) None of these answers is correct.
   Answer:  A
   Diff: 2
   Terms:  spoilage, weighted-average method
   Objective:  3
   AACSB:  Reflective thinking

19) Under the FIFO method, all spoilage costs are assumed to be related to the units:
   A) in beginning inventory, plus the units completed during the period
   B) completed during the period
   C) in ending inventory
   D) in both beginning and ending inventory plus the units completed during the period
   Answer:  B
   Diff: 2
   Terms:  spoilage, first-in, first-out method
   Objective:  3
   AACSB:  Ethical reasoning
Answer the following questions using the information below:

Cartwright Custom Carpentry manufactures chairs in its Processing Department. Direct materials are included at the inception of the production cycle and must be bundled in single kits for each unit. Conversion costs are incurred evenly throughout the production cycle. Inspection takes place as units are placed into production. After inspection, some units are spoiled due to nondetectible material defects. Spoiled units generally constitute 3% of the good units. Data provided for March 20X5 are as follows:

WIP, beginning inventory 3/1/20X5 30,000 units
  Direct materials (100% complete)
  Conversion costs (89.5% complete)

Started during March 80,000 units
Completed and transferred out 86,000 units
WIP, ending inventory 3/31/20X5 20,000 units
  Direct materials (100% complete)
  Conversion costs (75% complete)

Costs:
  WIP, beginning inventory:
    Direct materials $ 70,000
    Conversion costs 40,000
    Direct materials added 160,000
    Conversion costs added 120,000

20) What are the normal and abnormal spoilage units, respectively, for March when using FIFO?
   A) 2,580 units; 1,420 units
   B) 1,950 units; 1,390 units
   C) 1,690 units; 1,050 units
   D) 1,420 units; 2,000 units
   Answer: A
   Explanation: A) Normal spoilage = 3% × 86,000 units = 2,580 spoiled units
               Abnormal spoilage = (30,000 units + 80,000) - (86,000 units + 20,000) - 2,580 = 1,420 units
               Diff: 3
   Terms: normal spoilage, abnormal spoilage
   Objective: 3
   AACSB: Analytical skills
21) What costs would be associated with normal and abnormal spoilage, respectively, using the FIFO method of process costing?
A) $5,890.64; $9,133.20
B) $5,890.64; $5,826.00
C) $6,469.64; $7,690.36
D) $9,133.20; $5,026.80
Answer: D
Explanation: D) Direct Materials Conversion Costs
WIP, beginning inventory Costs added during period $160,000 $120,000
Total cost to account for 160,000 120,000
Divided by equivalent units 80,000 * 78,150 **
Equivalent-unit costs $2.00 $1.54

(56,000 + 2,580 + 1,420 + 20,000) = 80,000 units
Normal spoilage = 3% × 86,000 units = 2,580 spoiled units
Abnormal spoilage = (30,000 units + 80,000) - (86,000 units + 20,000) - 2,580 = 1,420 units

(3,150 + 56,000 + 2,580 + 1,420 + 15,000) = 78,150 units
Normal Spoilage = 2,580 units × $3.54 = $9,133.20
Abnormal Spoilage = 1,420 units × $3.54 = $5,026.80
Diff: 3
Terms: first-in, first-out method, normal spoilage, abnormal spoilage
Objective: 3
AACSB: Analytical skills
22) What costs are allocated to the ending work-in-process inventory for direct materials and conversion costs, respectively, using the FIFO method of process costing?

A) $38,250; $24,850
B) $40,000; $23,100
C) $40,000; $21,590
D) $49,500; $13,600

Answer: B

Explanation: B)  

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<td>$120,000</td>
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<tr>
<td>Costs added during period</td>
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</tr>
<tr>
<td>Total cost to account for</td>
<td>160,000</td>
<td>120,000</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td>80,000</td>
<td>78,150 **</td>
</tr>
<tr>
<td>Equivalent-unit costs</td>
<td>$2.00</td>
<td>$1.54</td>
</tr>
</tbody>
</table>

(56,000 + 2,580 + 1,420 + 20,000) = 80,000 units

Normal spoilage = 3% × 86,000 units = 2,580 spoiled units
Abnormal spoilage = (30,000 units + 80,000) - (86,000 units + 20,000) - 2,580 = 1,420 units

(3,150 + 56,000 + 2,580 + 1,420 + 15,000) = 78,150 units

Normal Spoilage = 2,580 units × $3.54 = $9,133.20
Abnormal Spoilage = 1,420 units × $3.54 = $5,026.80

Direct materials: 20,000 units × $2.00 = $40,000
Conversion costs: 15,000 units × $1.54 = $23,100
Diff: 3

Terms: first-in, first-out method, spoilage
Objective: 3
AACSB: Analytical skills
23) Which of the following journal entries correctly represents the transfer of completed goods for the current period using the FIFO method of process costing?

A) Finished Goods 10,560.28
   Loss from Spoilage 10,560.28
B) Loss from Spoilage 5,026.80
   Finished Goods 5,026.80
C) Finished Goods 327,251.00
   Work in Process 327,251.00
D) Finished Goods 401,700.00
   Work in Process 401,700.00

Answer: C

Explanation: C)

<table>
<thead>
<tr>
<th>Direct Materials</th>
<th>Conversion Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIP, beginning inventory</td>
<td>$160,000</td>
</tr>
<tr>
<td>Costs added during period</td>
<td>160,000</td>
</tr>
<tr>
<td>Total cost to account for</td>
<td>$320,000</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td>80,000</td>
</tr>
<tr>
<td>Equivalent-unit costs</td>
<td>$2.00</td>
</tr>
</tbody>
</table>

\[(56,000 + 2,580 + 1,420 + 20,000) = 80,000\] units

Normal spoilage = 3% × 86,000 units = 2,580 spoiled units

Abnormal spoilage = (30,000 units + 80,000) - (86,000 units + 20,000) - 2,580 = 1,420 units

\[(3,150 + 56,000 + 2,580 + 1,420 + 15,000) = 78,150\] units

Normal Spoilage = 2,580 units × $3.54 = $9,133.20

Abnormal Spoilage = 1,420 units × $3.54 = $5,026.80

Direct materials: 20,000 units × $2.00 = $40,000
Conversion costs: 15,000 units × $1.54 = $23,100

Abnormal spoilage $5,026.80
Beginning WIP completed 110,000.00
Costs added 4,851.00
Started and completed 198,240.00
Normal spoilage 9,133.20
Total cost transferred out $327,251.00
Diff: 3

Terms: first-in, first-out method, spoilage
Objective: 3
AACSB: Reflective thinking
Answer the following questions using the information below:

Samantha's Office Supplies manufactures desk organizers in its Processing Department. Direct materials are included at the inception of the production cycle and must be bundled in single kits for each unit. Conversion costs are incurred evenly throughout the production cycle. Inspection takes place as units are placed into production. After inspection, some units are spoiled due to nondetectible material defects. Spoiled units generally constitute 4% of the good units. Data provided for February 2012 are as follows:

WIP, beginning inventory 2/1/2012 50,000 units
   Direct materials (100% complete)
   Conversion costs (50% complete)

Started during February 164,000 units
Completed and transferred out 162,000 units

WIP, ending inventory 2/29/2012 30,000 units
   Direct materials (100% complete)
   Conversion costs (25% complete)

Costs:
   WIP, beginning inventory:
      Direct materials $ 300,000
      Conversion costs 88,000
   Direct materials added 419,832
   Conversion costs added 219,786

24) What are the normal and abnormal spoilage units, respectively, for February when using FIFO?  
   A) 2,800 units; 2,960 units  
   B) 6,560 units; 3,280 units  
   C) 6,480 units; 15,520 units  
   D) 6,480 units; 22,000 units  
   Answer:  C  
   Explanation:  C) Normal spoilage = 4% × 162,000 units = 6,480 spoiled units  
   Abnormal spoilage = (50,000 + 164,000 - 162,000 - 30,000 - 6,480) = 15,520 units  
   Diff: 3  
   Terms: normal spoilage, abnormal spoilage  
   Objective: 3  
   AACSB: Analytical skills
25) What costs would be associated with normal and abnormal spoilage, respectively, using the FIFO method of process costing?
A) $25,142; $60,216
B) $60,216; $25,142
C) $2,514; $6,020
D) $16,000; $8,000
Answer: A

Explanation: A) Direct Materials  Conversion Costs
WIP, beginning inventory
Costs added during period $419,832 $ 219,876
Total cost to account for 419,832 219,876
Divided by equivalent units 164,000 * 166,500 **
Equivalent-unit costs $ 2.56 $ 1.32

Total Cost per equivalent unit = $2.56 + $1.32 = $3.88

Normal spoilage = 4% × 162,000 units = 6,480 spoiled units
Abnormal spoilage = (50,000 units + 164,000) - (162,000 units + 30,000) - 6,480 = 15,520 units

* (112,000 + 6,480 + 15,520 + 30,000) = 164,000 units
** (.5 × 50,000 + 112,000 + 6,480 + 15,520 + .25 × 30,000) = 166,500 units

Normal Spoilage = 6,480 units × $3.88 = $25,142
Abnormal Spoilage = 7,760 units × $3.88 = $60,216
Diff: 3

Terms: first-in, first-out method, normal spoilage, abnormal spoilage
Objective: 3
AACSB: Analytical skills
26) What costs are allocated to the ending work-in-process inventory for direct materials and conversion costs, respectively, using the FIFO method of process costing?
A) $76,500; $9,700
B) $80,000; $46,200
C) $76,800; $9,900
D) $99,000; $76,800
Answer: C
Explanation: C)  Direct Materials  Conversion Costs
WIP, beginning inventory
Costs added during period  $419,832  $ 219,876
Total cost to account for  419,832  219,876
Divided by equivalent units  164,000 *  166,500 **
Equivalent-unit costs  $ 2.56  $ 1.32
Total Cost per equivalent unit = $2.56 + $1.32 = $3.88
Direct materials: 30,000 units × $2.56 = $76,800
Conversion costs: 30,000 units × .25 × $1.32 = $9,900
Diff: 3
Terms: first-in, first-out method, spoilage
Objective: 3
AACSB: Analytical skills
27) What are the direct material and conversion costs of all the units that were initially in the beginning work-in-process inventory and were subsequently shipped? Take into account the costs related to the completion of the conversion of the units during the month. Use the FIFO method of process costing.

A) $76,500; $49,700
B) $0; $33,000
C) $80,000; $43,180
D) $99,000; $27,200
Answer: B

Explanation: B)  

<table>
<thead>
<tr>
<th>Direct Materials</th>
<th>Conversion Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIP, beginning inventory</td>
<td>$419,832</td>
</tr>
<tr>
<td>Costs added during period</td>
<td>419,832</td>
</tr>
</tbody>
</table>

Divided by equivalent units

| Equivalent-unit costs | $2.56 | $1.32 |

Total Cost per equivalent unit = $2.56 + $1.32 = $3.88

Normal spoilage = 4% × 162,000 units = 6,480 spoiled units
Abnormal spoilage = (50,000 units + 164,000) - (162,000 units + 30,000) - 6,480 = 15,520 units

* (112,000 + 6,480 + 15,520 + 30,000) = 164,000 units
** (.5 × 50,000 + 112,000 + 6,480 + 15,520 + .25 × 30,000) = 166,500 units

Normal Spoilage =6,480 units × $3.88 = $25,142
Abnormal Spoilage =15,520 units × $3.88 = $60,216

Beginning WIP:
Direct Material cost = $0
Conversion Cost = 50,000 units × 50% × $1.32 = $33,000

Diff: 3
Terms: first-in, first-out method, spoilage
Objective: 3
AACSB: Analytical skills
28) What are the total costs of all the units that were initially in the beginning work-in-process inventory and were subsequently shipped? Take into account the costs related to the completion of the conversion of the units during the month. Use the FIFO method of process costing.
A) $388,000  
B) $33,000  
C) $421,000  
D) $194,000  
Answer: C

Explanation: C)

<table>
<thead>
<tr>
<th>Direct Materials</th>
<th>Conversion Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIP, beginning inventory</td>
<td>$419,832</td>
</tr>
<tr>
<td>Costs added during period</td>
<td>419,832</td>
</tr>
<tr>
<td>Total cost to account for</td>
<td>164,000 *</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td>$2.56</td>
</tr>
</tbody>
</table>

Total Cost per equivalent unit = $2.56 + $1.32 = $3.88

Normal spoilage = 4% × 162,000 units = 6,480 spoiled units  
Abnormal spoilage = (50,000 units + 164,000) - (162,000 units + 30,000) - 6,480 = 15,520 units

* (112,000 + 6,480 + 15,520 + 30,000) = 164,000 units  
** (.5 × 50,000 + 112,000 + 6,480 + 15,520 + .25 × 30,000) = 166,500 units

Costs related to Beginning WIP:  
Costs Carried Forward from Previous period = $300,000 + $88,000 = $388,000  
Additional Conversion Cost = 50,000 units × 50% $1.32 = $33,000  
Total = $421,000  
Diff: 3  
Terms: first-in, first-out method, spoilage  
Objective: 3  
AACSB: Analytical skills
29) What are the total costs of all the units that were started during February and subsequently shipped before the end of the period?

A) $628,560  
B) $434,560  
C) $636,320  
D) $307,000  

Answer: B  
Explanation: B)  

<table>
<thead>
<tr>
<th>Direct Materials</th>
<th>Conversion Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIP, beginning inventory</td>
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</tr>
<tr>
<td>Costs added during period</td>
<td>$419,832</td>
</tr>
<tr>
<td>Total cost to account for</td>
<td>419,832</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td>164,000 *</td>
</tr>
<tr>
<td>Equivalent-unit costs</td>
<td>$2.56</td>
</tr>
</tbody>
</table>

Total Cost per equivalent unit = $2.56 + $1.32 = $3.88

Normal spoilage = 4% × 162,000 units = 6,480 spoiled units  
Abnormal spoilage = (50,000 units + 164,000) - (162,000 units + 30,000) - 6,480 = 15,520 units

Costs related to units that were started and completed in the period:  
Started and Completed = Shipped Units less beginning Inventory  
= 162,000 - 50,000 = 112,000 units

Cost = 112,000 units × $3.88 = $434,560

Diff: 3  
Terms: first-in, first-out method, spoilage  
Objective: 3  
AACSB: Analytical skills
30) Which of the following journal entries correctly represents the transfer of completed goods begun during February using the FIFO method of process costing?

A) Finished Goods 940,913
   Work in Process 940,913
B) Loss from Spoilage 25,142
   Finished Goods 25,142
C) Finished Goods 434,560
   Work in Process 434,560
D) Finished Goods 628,560
   Work in Process 628,560

Answer: C

Explanation: C)

<table>
<thead>
<tr>
<th>Direct Materials</th>
<th>Conversion Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>WIP, beginning inventory</td>
<td>$419,832</td>
</tr>
<tr>
<td>Costs added during period</td>
<td></td>
</tr>
<tr>
<td>Total cost to account for</td>
<td>419,832</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td>164,000 *</td>
</tr>
<tr>
<td>Equivalent-unit costs</td>
<td>$2.56</td>
</tr>
<tr>
<td>Total Cost per equivalent unit = $2.56 + $1.32 = $3.88</td>
<td></td>
</tr>
</tbody>
</table>

Normal spoilage = 4% × 162,000 units = 6,480 spoiled units
Abnormal spoilage = (50,000 units + 164,000) - (162,000 units + 30,000) - 6,480 = 15,520 units

* (112,000 + 6,480 + 15,520 + 30,000) = 164,000 units
** (.5 × 50,000 + 112,000 + 6,480 + 15,520 + .25 × 30,000) = 166,500 units

Costs related to Beginning WIP:
Costs Carried Forward from Previous period = $300,000 + $88,000 = $388,000
Additional Conversion Cost = 50,000 units × 50% $1.32 = $33,000
Total = $421,000

Costs related to units that were started and completed in the period:
Started and Completed = Shipped Units less beginning Inventory
= 162,000 - 50,000 = 112,000 units
Cost = 112,000 units × $3.88 = $434,560

Costs to transfer out = $25,142 + $60,216 + $421,000 + $434,555
= $940,913
Diff: 3
Terms: first-in, first-out method, spoilage
Objective: 3
AACSB: Reflective thinking
31) The first step in the five-step procedure for process costing with spoilage is to compute the output in terms of equivalent units.
Answer: FALSE 
Explanation: The first step in the five-step procedure for process costing with spoilage is to summarize the flow of physical units.
Diff: 2
Terms: process costing, spoilage
Objective: 3
AACSB: Analytical skills

32) The last step in the five-step procedure for process costing with spoilage is to summarize total costs to account for.
Answer: FALSE 
Explanation: The last step in the five-step procedure for process costing with spoilage is to assign total costs to units completed, to spoiled units, and to units in ending work in process.
Diff: 2
Terms: process costing, spoilage
Objective: 3
AACSB: Analytical skills

33) Counting spoiled units as part of output units in a process-costing system usually results in a higher cost per unit.
Answer: FALSE 
Explanation: Counting spoiled units usually results in a lower cost per unit.
Diff: 3
Terms: spoilage
Objective: 3
AACSB: Analytical skills

34) Costs in beginning inventory are pooled with costs in the current period when determining the costs of good units under the weighted-average method of process costing.
Answer: TRUE
Diff: 2
Terms: weighted-average method
Objective: 3
AACSB: Analytical skills

35) Under the weighted-average method, the costs of normal spoilage are added to the costs of their related good units. Hence, the cost per good unit completed and transferred out equals the total costs transferred out divided by the number of good units produced.
Answer: TRUE
Diff: 3
Terms: weighted-average method, normal spoilage
Objective: 3
AACSB: Analytical skills
36) Spoilage is typically assumed to occur at the stage of completion where inspection takes place.
Answer: TRUE
Diff: 2
Terms: inspection point
Objective: 3
AACSB: Ethical reasoning

37) Spoilage and rework costs are thoroughly captured in the accounting system.
Answer: FALSE
Explanation: The actual costs of spoilage and rework are often greater than the costs recorded in the accounting system because the opportunity costs of disruption of the production line, storage, and lost contribution margin are not recorded in accounting systems.
Diff: 2
Terms: spoilage, rework
Objective: 3
AACSB: Analytical skills

38) Under the FIFO method, all spoilage costs are assumed to be related to the units completed during this period using the unit costs of the current period.
Answer: TRUE
Diff: 3
Terms: first-in, first-out method, spoilage
Objective: 3
AACSB: Analytical skills

39) When spoiled goods have a disposal value, the net cost of spoilage is computed by adding the disposal value to the costs of the spoiled goods accumulated to the inspection point.
Answer: FALSE
Explanation: The net cost of spoilage is computed by subtracting the disposal value from the costs of the spoiled goods accumulated to the inspection point.
Diff: 2
Terms: spoilage
Objective: 3
AACSB: Analytical skills

40) To simplify calculations under FIFO, spoiled units are accounted for as if they were started in the current period.
Answer: TRUE
Diff: 2
Terms: spoilage
Objective: 3
AACSB: Analytical skills

41) Normal spoilage costs are usually deducted from the costs of good units.
Answer: FALSE
Explanation: Normal spoilage is usually added to the cost of the good units.
Diff: 2
Terms: normal spoilage
Objective: 3
AACSB: Analytical skills
42) Identify the appropriate order of the following steps in the procedure for process costing with spoilage.

a. summarize total costs to account for  
b. assign total costs to units completed, to spoiled units, and to units in ending inventory  
c. summarize the flow of physical units  
d. compute output in terms of equivalent units  
e. compute cost per equivalent unit

Step 1 ________  
Step 2 ________  
Step 3 ________  
Step 4 ________  
Step 5 ________  
Answer:  
Step 1 c. summarize the flow of physical units  
Step 2 d. compute output in terms of equivalent units  
Step 3 a. summarize total costs to account for  
Step 4 e. compute cost per equivalent unit  
Step 5 b. assign total costs to units completed, to spoiled units, and to units in ending inventory  
Diff: 2  
Terms: process costing, spoilage  
Objective: 3  
AACSB: Reflective thinking
43) Endicott Shoes manufactures shoes. All direct materials are included at the inception of the production process. For March, there were 1,400 units in beginning inventory with a direct material cost of $700. Direct materials totaled $15,000 for the month. Work-in-process records revealed that 35,000 units were started in March and that 30,000 were finished. Normal spoilage of 2% of units finished was incurred. Ending work-in-process units are complete in respect to direct materials costs. Spoilage is not detected until the process is complete. Endicott uses the weighted-average method.

**Required:**

a. What are the direct materials costs assigned to completed good units when spoilage units are recognized or when they are ignored?

b. What are the direct material amounts allocated to the work-in-process ending inventory when spoilage units are recognized or ignored?

**Answer:**

a. Equivalent units (spoilage recognized) = 1,400 + 35,000 = 36,400

Equivalent units (spoilage ignored) = 1,400 + 35,000 - (30,000 × 0.02) = 35,800

<table>
<thead>
<tr>
<th>Recognized</th>
<th>Ignored</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost to account for:</td>
<td></td>
</tr>
<tr>
<td>Beginning work in process</td>
<td>$700</td>
</tr>
<tr>
<td>Current period</td>
<td>15,000</td>
</tr>
<tr>
<td>Total costs to account for</td>
<td>$15,700</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td>36,400</td>
</tr>
<tr>
<td>Cost per equivalent unit</td>
<td>$0.431</td>
</tr>
</tbody>
</table>

Assigned to good units:

- (29,400 × $0.431) $12,671
- (29,400 × $0.439) $12,907

b. Ending work in process:

- (6,400 × $0.431) $2,758
- (6,400 × $0.439) $2,810

**Diff: 3**

Terms: spoilage
Objective: 3
AACSB: Analytical skills
44) Viking Sports is a manufacturer of sportswear. It produces all of its products in one department. The information for the current month is as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning work in process</td>
<td>20,000</td>
</tr>
<tr>
<td>Units started</td>
<td>40,000</td>
</tr>
<tr>
<td>Units completed</td>
<td>50,000</td>
</tr>
<tr>
<td>Ending work in process</td>
<td>8,000</td>
</tr>
<tr>
<td>Spoilage</td>
<td>2,000</td>
</tr>
<tr>
<td>Beginning work-in-process direct materials</td>
<td>$12,000</td>
</tr>
<tr>
<td>Beginning work-in-process conversion</td>
<td>$ 4,000</td>
</tr>
<tr>
<td>Direct materials added during month</td>
<td>$60,000</td>
</tr>
<tr>
<td>Direct manufacturing labor during month</td>
<td>$20,000</td>
</tr>
</tbody>
</table>

Beginning work in process was half complete as to conversion. Direct materials are added at the beginning of the process. Factory overhead is applied at a rate equal to 50% of direct manufacturing labor. Ending work in process was 60% complete. All spoilage is normal and is detected at end of the process. **Required:** Prepare a production cost worksheet if spoilage is recognized and the weighted-average method is used.

**Answer:**

**PRODUCTION COST WORKSHEET**

<table>
<thead>
<tr>
<th>Flow of Production</th>
<th>Physical units</th>
<th>Direct materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>20,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Started during period</td>
<td>40,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To account for</td>
<td>60,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good units completed</td>
<td>50,000</td>
<td>50,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Normal spoilage</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Work in process, ending</td>
<td>8,000</td>
<td>8,000</td>
<td>4,800</td>
</tr>
<tr>
<td>Accounted for</td>
<td>60,000</td>
<td>60,000</td>
<td>56,800</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Costs</th>
<th>Totals</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>$16,000</td>
<td>$12,000</td>
<td>$ 4,000</td>
</tr>
<tr>
<td>Costs added during period</td>
<td>90,000</td>
<td>60,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Total costs to account for</td>
<td>106,000</td>
<td>72,000</td>
<td>34,000</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td>60,000</td>
<td>56,800</td>
<td></td>
</tr>
<tr>
<td>Equivalent unit costs</td>
<td>$1.80</td>
<td>$1.20</td>
<td>$0.60</td>
</tr>
</tbody>
</table>

**Assignment of costs**

| Costs transferred out (50,000 × $1.80) | $90,000   |
| Normal spoilage (2,000 × $1.80)       | 3,600     |
| Work in process, ending               |           |
| Direct materials (8,000 × $1.20)      | 9,600     |
| Conversion (8,000 × $0.60 × 0.60)     | 2,880     |

Costs accounted for | **$106,080**

(Differences due to rounding)
45) Silver Spoon Incorporated is a manufacturer of kitchen utensils. It produces all of its products in one department. The information for the current month is as follows:

- Beginning work in process: 37,500 units
- Units started: 55,000 units
- Units completed: 75,000 units
- Ending work in process: 14,500 units
- Spoilage: 3,000 units

- Beginning work-in-process direct materials: $25,000
- Beginning work-in-process conversion: $10,000
- Direct materials added during month: $113,750
- Direct manufacturing labor during month: $40,020

Beginning work in process was 25% complete as to conversion. Direct materials are added at the beginning of the process. Factory overhead is applied at a rate equal to 37.5% of direct manufacturing labor. Ending work in process was 60% complete. All spoilage is normal and is detected at the end of the process.

**Required:**
Prepare a production cost worksheet if spoilage is recognized and the weighted-average method is used.

**Answer:**
PRODUCTION COST WORKSHEET

<table>
<thead>
<tr>
<th>Flow of Production</th>
<th>Physical units</th>
<th>Direct materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>37,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Started during period</td>
<td>55,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To account for</td>
<td>92,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good units completed</td>
<td>75,000</td>
<td>75,000</td>
<td>75,000</td>
</tr>
<tr>
<td>Normal spoilage</td>
<td>3,000</td>
<td>3,000</td>
<td>3,000</td>
</tr>
<tr>
<td>Work in process, ending</td>
<td>14,500</td>
<td>14,500</td>
<td>8,700</td>
</tr>
<tr>
<td>Accounted for</td>
<td>92,500</td>
<td>92,500</td>
<td>86,700</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Costs</th>
<th>Totals</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>$35,000</td>
<td>$25,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Costs added during period</td>
<td>168,778</td>
<td>113,750</td>
<td>55,028</td>
</tr>
<tr>
<td>Total costs to account for</td>
<td>203,778</td>
<td>138,750</td>
<td>65,028</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td>92,500</td>
<td>86,700</td>
<td></td>
</tr>
<tr>
<td>Equivalent unit costs</td>
<td>$2.25</td>
<td>$1.50</td>
<td>$0.75</td>
</tr>
</tbody>
</table>

Copyright © 2012 Pearson Education, Inc.
Costs transferred out (75,000 × $2.25) $168,750
Normal spoilage (3,000 × $2.25) 6,750
Work in process, ending
Direct materials (14,500 × $1.50) 21,750
Conversion (14,500 × $0.75 × 0.60) 6,525

Costs accounted for $203,775

Diff: 2
Terms: spoilage, weighted-average method
Objective: 3
AACSB: Analytical skills

46) New Image Sports uses a process-costing system. For March, the company had the following activities:

Beginning work-in-process inventory (1/3 complete) 6,000 units
Units placed in production 24,000 units
Good units completed 18,000 units
Ending work-in-process inventory 10,000 units

Cost of beginning work in process $5,000
Direct material costs, current $18,000
Conversion costs, current $13,800

Direct materials are placed into production at the beginning of the process. All spoilage is normal and is detected at the end of the process. Ending WIP is 50% completed as to conversion.

**Required:**
Prepare a production cost worksheet using the FIFO method.

**Answer:** Normal spoilage = 6,000 + 24,000 - 18,000 - 10,000 = 2,000
Started and completed = 18,000 - 6,000 = 12,000

**PRODUCTION COST WORKSHEET**

<table>
<thead>
<tr>
<th>Flow Of Production</th>
<th>Physical Units</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>6,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Started during period</td>
<td>24,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To account for</td>
<td>30,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good units completed:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beginning work in process</td>
<td>6,000</td>
<td>4,000</td>
<td></td>
</tr>
<tr>
<td>Started and completed</td>
<td>12,000</td>
<td>12,000</td>
<td>12,000</td>
</tr>
<tr>
<td>Normal spoilage</td>
<td>2,000</td>
<td>2,000</td>
<td>2,000</td>
</tr>
<tr>
<td>Work in process, ending</td>
<td>10,000</td>
<td>10,000</td>
<td>5,000</td>
</tr>
<tr>
<td>Accounted for</td>
<td>30,000</td>
<td>24,000</td>
<td>23,000</td>
</tr>
<tr>
<td>Costs</td>
<td>Totals</td>
<td>Direct Materials</td>
<td>Conversion</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>--------</td>
<td>------------------</td>
<td>------------</td>
</tr>
<tr>
<td>Work in process, beginning</td>
<td>$ 5,000</td>
<td>$18,000</td>
<td>$13,800</td>
</tr>
<tr>
<td>Costs added during period</td>
<td>31,800</td>
<td>$18,000</td>
<td>$13,800</td>
</tr>
<tr>
<td>Total costs to account for</td>
<td>$36,800</td>
<td>$18,000</td>
<td>$13,800</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td></td>
<td>24,000</td>
<td>23,000</td>
</tr>
<tr>
<td>Equivalent-unit costs</td>
<td>$ 1.35</td>
<td>$ 0.75</td>
<td>$ 0.60</td>
</tr>
</tbody>
</table>

Assignment of cost:
- Work in process, beginning: $5,000
- Completion of beginning: (4,000 x $0.60) = $2,400

Total beginning inventory: 7,400
- Started and completed: (12,000 x $1.35) = 16,200
- Normal spoilage: (2,000 x $1.35) = 2,700

Total costs transferred out: 26,300
- Work in process, ending:
  - Direct materials: (10,000 x $0.75) = $7,500
  - Conversion: (10,000 x $0.60 x 0.5) = $3,000

Costs accounted for: $36,800

Diff: 3

Terms: normal spoilage, spoilage, first-in, first-out method
Objective: 3
AACSB: Analytical skills

47) Weather Instruments assembles products from component parts. It has two departments that process all products. During January, the beginning work in process in the assembly department was half complete as to conversion and complete as to direct materials. The beginning inventory included $12,000 for materials and $4,000 for conversion costs. Overhead is applied at the rate of 50% of direct manufacturing labor costs. Ending work-in-process inventory in the assembly department was 40% complete. All spoilage is considered normal and is detected at the end of the process.

Beginning work in process in the finishing department was 75% complete as to conversion and ending work in process was 25% converted. Direct materials are added at the end of the process. Beginning inventories included $16,000 for transferred-in costs and $10,000 for direct manufacturing labor costs. Overhead in this department is equal to direct manufacturing labor costs. Additional information about the two departments follows:

<table>
<thead>
<tr>
<th></th>
<th>Assembly</th>
<th>Finishing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning work-in-process units</td>
<td>20,000</td>
<td>24,000</td>
</tr>
<tr>
<td>Units started this period</td>
<td>40,000</td>
<td>?</td>
</tr>
<tr>
<td>Units transferred this period</td>
<td>50,000</td>
<td>54,000</td>
</tr>
<tr>
<td>Ending work-in-process units</td>
<td>8,000</td>
<td>20,000</td>
</tr>
<tr>
<td>Material costs added</td>
<td>$44,000</td>
<td>$28,000</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>$16,000</td>
<td>$24,000</td>
</tr>
</tbody>
</table>
**Required:**
Prepare a production cost worksheet using weighted-average for the assembly department and FIFO for the finishing department.

Answer: Normal spoilage in assembly = 20,000 + 40,000 - 50,000 - 8,000 = 2,000

**PRODUCTION COST WORKSHEET**
Assembly Department
Weighted-Average Method

<table>
<thead>
<tr>
<th>Flow of production</th>
<th>Physical Units</th>
<th>Direct Materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>20,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Started during period</td>
<td>40,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To account for</td>
<td>60,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Good units completed and accounted for | | | |
| Transferred out | 50,000 | 50,000 | 50,000 |
| Normal spoilage | 2,000 | 2,000 | 2,000 |
| Work in process, ending | 8,000 | 8,000 | 3,200 |
| Accounted for | 60,000 | 60,000 | 55,200 |

<table>
<thead>
<tr>
<th>Costs</th>
<th>Totals</th>
<th>Direct materials</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>$16,000</td>
<td>$12,000</td>
<td>$ 4,000</td>
</tr>
<tr>
<td>Costs added during period</td>
<td>68,000</td>
<td>44,000</td>
<td>24,000</td>
</tr>
<tr>
<td>Total costs to account for</td>
<td>84,000</td>
<td>56,000</td>
<td>28,000</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td>60,000</td>
<td>55,200</td>
<td></td>
</tr>
<tr>
<td>Equivalent-unit costs</td>
<td>$1.44</td>
<td>$ 0.93</td>
<td>$ 0.51</td>
</tr>
</tbody>
</table>

**Assignment of costs**

| Transferred out (50,000 × 1.44) | $72,000 |
| Normal spoilage (2,000 × 1.44) | 2,880 |
| Total costs transferred out | 74,880 |
| Work in process, ending | | |
| Direct materials (8,000 × 0.93)$7,440 | $7,440 |
| Conversion (8,000 × 0.40 × 0.51)1,632 | 9,072 |
| Costs accounted for | | $83,952 |
| (Differences due to rounding) | | |
**PRODUCTION COST WORKSHEET**  
Finishing Department  
FIFO Method

### Flow of Production

<table>
<thead>
<tr>
<th>Units</th>
<th>Materials</th>
<th>Conversion</th>
<th>In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td>24,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Started during period</td>
<td>50,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>To account for</td>
<td>74,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Good units completed:

<table>
<thead>
<tr>
<th>Units</th>
<th>Materials</th>
<th>Conversion</th>
<th>In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beginning work in process</td>
<td>24,000</td>
<td>24,000</td>
<td>6,000</td>
</tr>
<tr>
<td>Started and completed</td>
<td>30,000</td>
<td>30,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Work in process, ending</td>
<td>20,000</td>
<td>0</td>
<td>5,000</td>
</tr>
</tbody>
</table>

Accounted for | 74,000 | 54,000 | 41,000 | 50,000 |

### Costs

<table>
<thead>
<tr>
<th>Units</th>
<th>Materials</th>
<th>Conversion</th>
<th>In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Costs added during period</td>
<td>$36,000</td>
<td>$28,000</td>
<td>$48,000</td>
</tr>
<tr>
<td>Total costs to account for</td>
<td>186,880</td>
<td>28,000</td>
<td>48,000</td>
</tr>
<tr>
<td>Divided by equivalent units</td>
<td>186,880</td>
<td>28,000</td>
<td>48,000</td>
</tr>
</tbody>
</table>

**Equivalent-unit costs:**

<table>
<thead>
<tr>
<th>Units</th>
<th>Materials</th>
<th>Conversion</th>
<th>In</th>
</tr>
</thead>
<tbody>
<tr>
<td>$3.19</td>
<td>$0.52</td>
<td>$1.17</td>
<td>$1.50</td>
</tr>
</tbody>
</table>

**Assignment of costs:**

<table>
<thead>
<tr>
<th>Units</th>
<th>Materials</th>
<th>Conversion</th>
<th>In</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work in process, beginning</td>
<td></td>
<td></td>
<td>$36,000</td>
</tr>
<tr>
<td>Completion of beginning:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct materials (24,000 × $0.52)</td>
<td></td>
<td></td>
<td>$12,480</td>
</tr>
<tr>
<td>Conversion costs (24,000 × 0.25 × $1.17)</td>
<td>7,020</td>
<td></td>
<td>19,500</td>
</tr>
<tr>
<td>Total beginning inventory</td>
<td></td>
<td></td>
<td>55,500</td>
</tr>
<tr>
<td>Started and completed (30,000 × $3.19)</td>
<td></td>
<td></td>
<td>95,700</td>
</tr>
<tr>
<td>Total costs transferred out</td>
<td></td>
<td></td>
<td>151,200</td>
</tr>
<tr>
<td>Work in process, ending</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transferred in (20,000 × $1.50)</td>
<td>$30,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conversion costs (20,000 × $1.17 × 0.25)</td>
<td>5,850</td>
<td></td>
<td>35,850</td>
</tr>
<tr>
<td>Costs accounted for</td>
<td></td>
<td></td>
<td>$187,050</td>
</tr>
<tr>
<td>(Differences due to rounding)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Diff: 3  
Terms: spoilage, normal spoilage, first-in, first-out method  
Objective: 3  
AACSB: Analytical skills
48) Harriet has been reviewing the accounting system for her company and she is very concerned about the accounting for spoilage. It appears that spoilage is accounted for only at the end of the processing cycle. While this concept is acceptable in general, Harriet believes that a better method can be found to properly account for the spoilage when it occurs. She believes that there must be something better than the weighted-average method of accounting for spoilage. She would like the company to use a method that provides closer tracking of the spoilage with the accounting for the spoilage.

**Required:**
Discuss the problems Harriet is having with the accounting system.

**Answer:** The main problem Harriet has is that she does not understand the accounting system. The use of weighted-average or FIFO is not for addressing the problems of spoilage tracking. While the methods differ slightly in the tracking of costs, FIFO keeps beginning inventories separate, and the point of accounting for spoilage is not affected by the accounting method. If the company can account for spoilage at different stages of completion, these stages can be converted into percentage of completion points, and the spoilage can be accounted for as the process completes each stage.

**Diff:** 3

**Terms:** spoilage, first-in, first-out method

**Objective:** 3

**AACSB:** Analytical skills

49) Spoilage can be a significant cost for many organizations. Discuss when spoilage might happen and how the costs of normal spoilage get allocated.

**Answer:** Spoilage may occur at various stages of the production process. In general, the cost of spoiled units is equal to the all costs incurred in producing the spoiled units up to the point of inspection. The costs of normal spoilage are allocated to units in ending work-in-process inventory. The most common approach is to presume that normal spoilage occurs at the inspection point in the production cycle and to allocate its cost over all units that have passed that point during the accounting period. One cost-benefit decision to be made is when to do inspections. Naturally, the earlier the spoilage is caught, the less costly it will be as the conversion costs will be lower in the early stages of production. The costs of performing inspections can be compared to the expected savings from reducing the spoilage costs as part of the determination of when in the process the inspections should happen.

**Diff:** 3

**Terms:** spoilage

**Objective:** 3

**AACSB:** Analytical skills

**Objective 18.4**

1) The inspection point is the:

A) stage of the production cycle where products are checked to determine whether they are acceptable or unacceptable units
B) point at which costs are allocated between normal and abnormal spoilage
C) point at which the calculation of equivalent units is made
D) None of these answers is correct.

**Answer:** A

**Diff:** 2

**Terms:** inspection point

**Objective:** 4

**AACSB:** Ethical reasoning
2) When spoiled goods have a disposal value, the net cost of the spoilage is computed by:
A) deducting disposal value from the costs of the spoiled goods accumulated to the inspection point
B) adding the costs to complete a salable product to the costs accumulated to the inspection point
C) calculating the costs incurred to the inspection point
D) None of these answers is correct.
Answer: A
Diff: 2
Terms: spoilage
Objective: 4
AACSB: Analytical skills

3) The costs of normal spoilage are allocated to the units in ending work-in-process inventory, in addition to completed units if the units:
A) in ending inventory have not passed the inspection point
B) in ending work-in-process inventory have passed the inspection point
C) in ending work in process inventory are more than 50% complete
D) in ending work-in-process inventory are less than 50% complete
Answer: B
Diff: 3
Terms: inspection point, normal spoilage
Objective: 4
AACSB: Analytical skills

4) Normal spoilage is computed on the basis of the number of:
A) good units that pass inspection during the current period
B) units that pass the inspection point during the current period
C) units that are 100% complete as to materials
D) None of these answers is correct.
Answer: A
Diff: 2
Terms: normal spoilage, inspection point
Objective: 4
AACSB: Reflective thinking

5) Which of the following INCORRECTLY reflects what units passed inspection this period? Assume beginning work in process was completed and ending work in process was started during the period.

<table>
<thead>
<tr>
<th>Inspection Point at Completion Level</th>
<th>10%</th>
<th>50%</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Beginning work in process (30% complete)</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>B) Started and completed</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>C) Ending work in process (40% complete)</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>D) Beginning work in process (5% complete)</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
Answer: D
Diff: 3
Terms: inspection point
Objective: 4
AACSB: Analytical skills
6) In general, it is presumed that normal spoilage occurs halfway between the beginning of the production process and the inspection point in the production cycle. This is because there is no easy way to determine where the spoilage has happened until the inspection has occurred.
Answer: FALSE
Explanation: The common approach is to presume that normal spoilage occurs at the inspection point in the production cycle.
Diff: 2
Terms: spoilage, standard costing
Objective: 4
AACSB: Analytical skills

7) All accounting systems must assume that the inspection point occurs when a process is 100% complete.
Answer: FALSE
Explanation: All accounting systems do not have to assume that the inspection point occurs when a process is 100% complete.
Diff: 2
Terms: inspection point
Objective: 4
AACSB: Communication

Objective 18.5

1) The Harleysville Manufacturing Shop produces motorcycle parts. Typically, 10 pieces out of a job lot of 1,000 parts are spoiled. Costs are assigned at the inspection point, $50.00 per unit. Spoiled pieces may be disposed at $10.00 per unit. The spoiled goods must be inventoried appropriately when the normal spoilage is detected. The current job requires the production of 2,500 good parts.

Which of the following journal entries properly reflects the recording of spoiled goods?

A) Materials Control  200
Manufacturing Overhead Control  800
   Work-in-Process Control  1,000
B) Materials Control  250
Manufacturing Overhead Control  1,000
   Work-in-Process Control  1,250
C) Work-in-Process Control  1,250
   Materials Control  250
   Manufacturing Overhead Control  1,000
D) Manufacturing Overhead Control  1,000
   Materials Control  200
   Work-in-Process Control  800

Answer: B
Explanation: B) Materials Control: 25 pieces × $10.00 = $250
Manufacturing Overhead Control: 25 pieces × ($50.00 - $10.00) = $1,000
WIP Control: 25 pieces × $50.00 = $1,250
Diff: 2
Terms: spoilage, inspection point
Objective: 5
AACSB: Reflective thinking
2) The Harleysville Manufacturing Shop produces motorcycle parts. Typically, 10 pieces out of a job lot of 1,000 parts are spoiled. Costs are assigned at the inspection point, $50.00 per unit. Spoiled pieces may be disposed at $10.00 per unit. The spoiled goods must be inventoried appropriately when the normal spoilage is detected. Job 101 requires the production of 2,500 good parts.

Which of the following journal entries would be correct if the spoilage occurred due to specifications required for Job 101?

A) Work-in-Process Control 100
   Materials Control 100
B) Materials Control 100
   Work-in-Process Control 100
C) Materials Control 250
   Work-in-Process Control 250
D) Work-in-Process Control 250
   Materials Control 250

Answer: C
Explanation: C) 25 pieces × $10.00 = $250
Diff: 2
Terms: normal spoilage, inspection point
Objective: 5
AACSB: Reflective thinking

3) A difference between job costing and process costing is that:
A) job-costing systems usually do not distinguish between normal spoilage attributable to all jobs and normal spoilage attributable to a specific job
B) job-costing systems usually distinguish between normal spoilage attributable to a specific job and spoilage common to all jobs
C) process costing normally does not distinguish between normal spoilage attributable to a specific job and spoilage common to all jobs
D) Both B and C are correct.

Answer: D
Diff: 2
Terms: spoilage, normal spoilage
Objective: 5
AACSB: Reflective thinking

4) Costs of abnormal spoilage are NOT considered to be inventoriable costs and are written off as costs of the accounting period in which the abnormal spoilage is detected.

Answer: TRUE
Diff: 3
Terms: abnormal spoilage, job costing
Objective: 5
AACSB: Analytical skills
5) When assigning costs, job-costing systems generally distinguish normal spoilage attributable to a specific job from normal spoilage common to all jobs.
Answer: TRUE
Diff: 3
Terms: job costing, process costing, normal spoilage
Objective: 5
AACSB: Analytical skills

6) When normal spoilage occurs because of the specifications of a particular job, that job bears the cost of the spoilage minus the disposal value of the spoilage.
Answer: TRUE
Diff: 3
Terms: normal spoilage
Objective: 5
AACSB: Communication

7) Shazam Machines produces numerous types of money change machines. All machines are made in the same production department and many use exactly the same processes. Because customers have such different demands for the machine characteristics, the company uses a job-costing system. Unfortunately, some of the production managers have been upset for the last few months when their jobs were charged with the spoilage that occurred over an entire processing run of several types of machines. Some of the best managers have even threatened to quit unless the accounting system is changed.

**Required:**
What recommendations can you suggest to improve the accounting for spoilage?
Answer: Because the manufacturing process uses similar workstations for the products, it may be best to let the spoilage be considered a manufacturing problem rather than a job problem. With this assumption, the spoilage will be spread over the entire production process with each job being charged an appropriate amount of spoilage, thereby relieving some jobs of bearing the entire burden of spoilage just because they were being worked on when the machines or process malfunctioned.
Diff: 2
Terms: spoilage
Objective: 5
AACSB: Analytical skills
Objective 18.6

1) Which of the following entries reflects the original cost assignment before production items are reworked?

A) Work-in-Process Control XXX
   Materials Control XXX
   Wages Payable Control XXX
   Manufacturing Overhead Allocated XXX

B) Finished Goods Control XXX
   Work-in-Process Control XXX

C) Manufacturing Overhead Allocated XXX
   Materials Control XXX
   Wages Payable Control XXX
   Work-in-Process Control XXX

D) Materials Control XXX
   Wages Payable Control XXX
   Work-in-Process Control XXX
   Manufacturing Overhead Allocated XXX

Answer: A
Diff: 2
Terms: rework
Objective: 6
AACSB: Reflective thinking

2) Accounting for rework in a process-costing system:

A) accounts for normal rework in the same way as a job-costing system
B) requires abnormal rework to be distinguished from normal rework
C) if the rework is normal, then rework is accounted for in the same manner as accounting for normal rework common to all jobs
D) All of these answers are correct.

Answer: D
Diff: 2
Terms: rework
Objective: 6
AACSB: Reflective thinking

3) In accounting for scrap, which one of the following statements is FALSE?

A) Normal scrap is accounted for separately from abnormal scrap
B) In accounting for scrap, there is no distinction between the scrap attributable to a specific job and scrap common to all jobs
C) Initial entries to scrap accounting records are most often made in dollar terms
D) All of these answers are correct.

Answer: D
Diff: 3
Terms: scrap
Objective: 6
AACSB: Reflective thinking
4) When rework is normal and NOT attributable to a specific job, the costs of rework are charged to manufacturing overhead and are spread, through overhead allocation, over all jobs.
Answer: TRUE
Diff: 2
Terms: rework
Objective: 6
AACSB: Analytical skills

5) Valentine Florists operate a flower shop. Because most of their orders are via telephone or fax, numerous orders have to be reworked. The average cost of the reworked orders is $6: $3.75 for labor, $1.50 for more flowers, and $0.75 for overhead. This ratio of costs holds for the average original order. On a recent day, the shop reworked 48 orders out of 249. The original cost of the 48 orders totaled $720. The average cost of all orders is $16.16, including rework, with an average selling price of $30

Required:
Prepare the necessary journal entry to record the rework for the day if the shop charges such activities to Arrangement Department Overhead Control. Prepare a journal entry to transfer the finished goods to Finished Goods Inventory.
Answer:
Arrangement Department Overhead Control 288
Materials Control (48 × $1.50) 72
Wages Payable Control (48 × $3.75) 180
Shop Overhead Control (48 × $0.75) 36
Finished Goods 720
Work-in-Process Control 720
Diff: 2
Terms: rework
Objective: 6
AACSB: Analytical skills
6) Robotoys Incorporated manufactures and distributes small robotic toys. Because most of its orders are via telephone or fax, numerous orders have to be reworked. The average cost of the reworked orders is $11.30: $4.15 for labor, $5.00 for more materials, and $2.15 for overhead. This ratio of costs holds for the average original order. On a recent day, the shop reworked 83 orders out of 700. The original cost of the 83 orders totaled $1,909. The average cost of all orders is $24.34, including rework, with an average selling price of $34.50.

**Required:**
Prepare the necessary journal entry to record the rework for the day if the shop charges such activities to Robo Department Overhead Control. Prepare journal entries to record all relevant rework charges as well as to transfer the reworked items finished goods to Finished Goods Inventory.

**Answer:**

<table>
<thead>
<tr>
<th>Account</th>
<th>Debit</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robo Department Overhead Control</td>
<td>937.90</td>
<td></td>
</tr>
<tr>
<td>Materials Control</td>
<td></td>
<td>415.00</td>
</tr>
<tr>
<td>Wages Payable Control</td>
<td></td>
<td>344.45</td>
</tr>
<tr>
<td>Shop Overhead Control</td>
<td></td>
<td>178.45</td>
</tr>
<tr>
<td>Finished Goods</td>
<td>1,909</td>
<td></td>
</tr>
<tr>
<td>Work-in-Process Control</td>
<td></td>
<td>1,909</td>
</tr>
</tbody>
</table>

Diff: 2
Terms: rework
Objective: 6
AACSB: Analytical skills

7) When a unit has to be reworked, the rework may be classified in three ways. What are those ways, and how does the accounting for each differ?

**Answer:** The rework may be (1) normal rework attributable to a specific job; (2) normal rework common to all jobs; or (3) abnormal rework. If the rework is attributable to a specific job, then the cost of such rework should be charged to that job. If the rework is common to all jobs, then the cost of the rework should be charged to manufacturing overhead and spread across all jobs. If the rework is abnormal rework then the cost of the rework should be charged as a loss to the period in which the rework is required.

Diff: 2
Terms: rework
Objective: 6
AACSB: Reflective thinking
Objective 18.7

1) When the amount of scrap is immaterial, the easiest accounting entry when recording scrap sold for cash is:
   A) Sales of Scrap
      Cash
   B) Cash
      Manufacturing Overhead Control
   C) Cash
      Sales of Scrap
   D) Accounts Receivable
      Sales of scrap
   Answer:  C
   Diff:  2
   Terms:  scrap
   Objective:  7
   AACSB:  Reflective thinking

2) Assume the amount of scrap is material and the scrap is sold immediately after it is produced. If the scrap attributable to a specific job is sold on account, the journal entry is:
   A) Work-in-Process Control
      Cash
   B) Work-in-Process Control
      Accounts Receivable
   C) Accounts Receivable
      Work-in-Process Control
   D) Work-in-Process Control
      Accounts Payable
   Answer:  C
   Diff:  3
   Terms:  scrap
   Objective:  7
   AACSB:  Reflective thinking

3) If scrap, common to all jobs, is returned to the storeroom and the time between the scrap being inventoried and its disposal is quite lengthy, the journal entry is:
   A) Work-in-Process Control
      Materials Control
   B) Materials Control
      Work-in-Process Control
   C) Manufacturing Overhead Control
      Materials Control
   D) Materials Control
      Manufacturing Overhead Control
   Answer:  D
   Diff:  3
   Terms:  scrap
   Objective:  7
   AACSB:  Reflective thinking
4) The accounting for scrap under process costing is similar to the accounting under:
A) job costing when scrap is different for each job
B) job costing when scrap is common to all jobs
C) process costing when scrap is different for each job
D) process costing when scrap is a common to all jobs
Answer: B
Diff: 2
Terms: scrap
Objective: 7
AACSB: Reflective thinking

5) Which of the following is NOT a major consideration when accounting for scrap?
A) keeping detailed records of physical quantities of scrap at all stages of the production process
B) inventory costing including when and how scrap affects operating income
C) planning and control including physical tracking
D) decisions as to whether to group scrap with reworked units
Answer: D
Diff: 2
Terms: scrap
Objective: 7
AACSB: Reflective thinking

6) Scrap is usually divided between normal and abnormal scrap.
Answer: FALSE
Explanation: No distinction is made between normal and abnormal scrap because no cost is assigned to scrap.
Diff: 2
Terms: scrap
Objective: 7
AACSB: Analytical skills

7) If scrap is returned to the company's storeroom and inventoried, it should NOT have any value in the accounting records.
Answer: FALSE
Explanation: The scrap will be inventoried. It might not have a value in dollars but it will have a physical quantity value.
Diff: 3
Terms: scrap
Objective: 7
AACSB: Ethical reasoning

8) When the dollar amount of scrap is immaterial, the simplest accounting is to record the physical quantity of scrap returned to the storeroom and to regard scrap sales as a separate line item in the income statement.
Answer: TRUE
Diff: 2
Terms: scrap
Objective: 7
AACSB: Analytical skills
9) Costs are assigned to scrap only if it is normal scrap.
Answer: FALSE
Explanation: Scrap is not broken down into normal and abnormal costs.
Diff: 2
Terms: scrap
Objective: 7
AACSB: Analytical skills

10) Accounting for scrap is very similar to accounting for byproducts.
Answer: TRUE
Diff: 2
Terms: scrap, byproducts
Objective: 7
AACSB: Analytical skills

11) Recognizing the value of scrap in the accounting records is always done at the time the scrap is produced.
Answer: FALSE
Explanation: There are methods in which the value of scrap is recognized at the time it is produced and there are methods in which the value of scrap is recognized at the time of its sale.
Diff: 2
Terms: scrap
Objective: 7
AACSB: Ethical reasoning
12) Busy Hands Craft Company is a small manufacturing company that specializes in arts and crafts items. It recently bought an old textile mill that it has refurbished to manufacture and dye special cloth to be sold in its craft shops. However, it discovered something new for its accounting system. The company never before had finished goods that did not meet standard, leftover materials from processing runs, or unacceptable outputs.

**Required:**
As the business consultant for the company, explain how it can handle the items mentioned. Include any potential problems with the accounting procedures.

**Answer:** First, an explanation of each item is needed.

1. Rework units are those units that are defective but can be reworked and sold as acceptable finished goods.
2. Scrap is leftover material that may have a minimal sales value. Scrap may be either sold, disposed, or reused in another job or processing run.
3. Spoilage is the production outputs that cannot be reworked. These units are discarded or sold for minimal value.

The potential problem with these areas is that they may be treated differently by the accounting system. The company should establish an acceptable and consistent method of handling each area. A consistent policy also aids the managers who are being evaluated by their department's efforts.

**Diff:** 2  
**Terms:** rework, scrap, spoilage  
**Objective:** 6, 7  
**AACSB:** Analytical skills

13) Explain the meaning of the terms spoilage, scrap, and rework. Provide an example of each. Is it possible for a single firm to have all three from a single productive process?

**Answer:** Spoilage is units of production that do not meet the specifications required by customers for good units, and are discarded or sold for reduced prices. An example of spoilage would be a damaged pair of Levi's Jeans sold as a "second."

Rework is unacceptable units that are subsequently repaired and sold as acceptable finished goods. An example of rework would be a pair of Jeans that might require some additional trimming before they become acceptable.

Scrap is residual material that results from manufacturing a product; it has low retail sales value compared with the total sales value of the product. An example of scrap would be any leftover material from a cutting process that is too small to use in any other clothing.

As the above examples indicate, a single productive process might generate, spoilage, scrap, and rework simultaneously.

**Diff:** 2  
**Terms:** spoilage, scrap, rework  
**Objective:** 6, 7  
**AACSB:** Reflective thinking
14) You are the chief financial officer of a lumber mill, and you are becoming quite concerned about the spoilage, scrap, and reworked items associated with your production processes. Your firm produces mainly products for the building industry.

**Required:**
Discuss the problems associated with these items and the methods your company can use to reduce spoilage, scrap, and reworked items.

**Answer:** The problems associated with these items include:
1. your company pays for the total raw material, not just the portion converted into a salable product;
2. the cost of disposing these unsalable or unused items, both the disposal costs and the costs and problems associated with finding a landfill site or other disposal site;
3. these disposed or unused items can create an eyesore, and attract the wrath of the environmentalists; and
4. developing high-value added products that can be produced from these various items.

The methods your company can use to reduce these items include:
1. calculating the costs of these problems because an accurate assessment of the total costs should certainly provide an incentive to your firm to investigate possible actions;
2. exploring methods of redesigning the production process to minimize these costs; and
3. investing in more sophisticated capital equipment that can be designed to reduce these costs.

Diff: 3
Terms: rework, scrap, spoilage
Objective: 6, 7
AACSB: Analytical skills

15) How can a company account for scrap? Include in your explanation a discussion of the two aspects of accounting for scrap.

**Answer:** Since scrap is a residual material that results from manufacturing a product, it has a low sales value as compared to the actual value of the product. The aspects of accounting for scrap are (1) planning and control of the scrap (which includes the physical tracking), and (2) inventory costing (which includes when and how scrap affects operating income).

Regarding the planning and control of the scrap it is important to measure how much scrap is being generated (by weighing or counting the pieces) and then keep records to indicate where the scrap is keeping a log of quantity and location. This will help to develop records that can be used to compare the amount of scrap generated to the expected amount generated based on budgets and units of good product completed. Also, since scrap has a value, it will reduce the likelihood that the scrap gets stolen.

In terms of the cost accounting for the scrap there are two options regarding when the scrap is potentially recognized in the accounting records: (1) at the time the scrap is produced, or (2) at the time the scrap is sold. If the dollar value of the scrap is immaterial, the simplest accounting method is to record the quantity of scrap returned to the storage area and then regard the scrap sales as a separate line item in the income statement. If the scrap is material in value, then it can be recognized at the time of its production and can have journal entries returning it to a materials control asset account (as a debit) and then credited when it later gets sold.

Diff: 2
Terms: scrap
Objective: 7
AACSB: Reflective thinking
16) For each of the following (actual real-world examples), develop products that can be sold from the listed scrap.

a. The Federal Reserve Banks destroy old money. Burning this money is usually forbidden under the environmental laws of most municipalities.
b. A manufacturer of cotton undergarments for prisoners has much cotton left over. The manufacturer is located in a very rural area of Alabama.
c. A hog renderer has hog bristles as a result of the slaughtering process.

Answer:

a. The Federal Reserve Banks bag up the shredded money and sell it in gift shops. This is a very efficient use of the scrap. The purchasers pay a price in excess of what the Federal Reserve would receive from any other source. Other uses might include selling for use as packaging materials.
b. The above manufacturer sells the scrap for use in the cleaning of guns. Other uses would include similar cleaning uses or dyeing the cloth and selling it for ornaments.
c. The hog bristles can be used in shaving equipment and for bristle brushes.

Diff: 2
Terms: scrap
Objective: 7
AACSB: Ethical reasoning

Objective 18.A

1) The standard-costing method:
A) adds a layer of complexity to the calculation of equivalent-unit costs in a process-costing environment
B) makes calculating equivalent-unit costs unnecessary
C) requires an analysis of the spoilage costs in beginning inventory
D) requires an analysis of the spoilage costs in ending inventory

Answer: B
Diff: 2
Terms: standard-costing method, spoilage
Objective: A
AACSB: Reflective thinking

2) Under standard costing, there is no need to calculate a cost per equivalent unit.

Answer: TRUE
Diff: 2
Terms: spoilage, standard costing
Objective: A
AACSB: Analytical skills
3) Springfield Sign Shop manufactures only specific orders. It uses a standard cost system. During one large order for the airport authority, an unusual number of signs were spoiled. The normal spoilage rate is 10% of units started. The point of first inspection is half way through the process, the second is three-fourths through the process, and the final inspection is at the end of the process. Other information about the job is as follows:

| Signs started | 3,000 |
| Signs spoiled | 450 |

| Direct materials put into process at beginning | $ 60,000 |
| Conversion costs for job | $120,000 |
| Standard direct material costs per sign | $27 |
| Standard conversion cost per sign | $54 |
| Average point of spoilage is the 3/4 completion point |
| Average current disposal cost per spoiled sign | $15 |

**Required:**
Make necessary journal entries to record all spoilage.

**Answer:**

**Average cost per sign when spoiled:**

| Direct material cost | $27.00 |
| Conversion ($54 × 3/4) | 40.50 |
| Total cost per spoiled sign | $67.50 |

\[
\text{Abnormal spoilage} = \text{Total spoilage} - \text{normal spoilage} \\
= 450 - 300 \\
= 150
\]

| Materials Control (450 × $15) | 6,750 |
| Loss from Abnormal Spoilage (150 × $52.50) | 7,875 |
| Manufacturing Overhead Control (300 × $52.50) | 15,750 |
| Work-in-Process Control, airport job (450 × $67.50) | 30,375 |

Diff: 3

Terms: spoilage, normal spoilage, standard cost system

Objective: A

AACSB: Analytical skills
1) Quality management provides an important competitive edge because it:
A) reduces costs
B) increases customer satisfaction
C) often results in substantial savings and higher revenues in the short run
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: quality
Objective: 1
AACSB: Ethical reasoning

2) Quality of design measures how closely the characteristics of products or services match the needs and wants of customers. Conformance quality:
A) measures the same things
B) is the performance of a product or service according to design and product specifications
C) is making the product according to design, engineering, and manufacturing specifications
D) focuses on fitness of uses from a customer perspective
Answer: B
Diff: 1
Terms: design quality
Objective: 1
AACSB: Ethical reasoning

3) Which of the following FAIL to satisfy conformance quality?
A) machines that fail to meet the needs of customers
B) machines that break down
C) depositing a customer's check into the correct account
D) All of these answers are correct.
Answer: B
Diff: 2
Terms: conformance quality
Objective: 1
AACSB: Reflective thinking

4) Costs incurred in precluding the production of products that do NOT conform to specifications are:
A) prevention costs
B) appraisal costs
C) internal failure costs
D) external failure costs
Answer: A
Diff: 2
Terms: conformance quality, prevention costs
Objective: 1
AACSB: Reflective thinking
5) Costs incurred in detecting which of the individual units of products do NOT conform to specifications are:
A) prevention costs
B) appraisal costs
C) internal failure costs
D) external failure costs
Answer: B
Diff: 2
Terms: conformance quality, appraisal costs
Objective: 1
AACSB: Reflective thinking

6) Costs incurred by a nonconforming product detected before it is shipped to customers are:
A) prevention costs
B) appraisal costs
C) internal failure costs
D) external failure costs
Answer: C
Diff: 2
Terms: conformance quality, internal failure costs
Objective: 1
AACSB: Reflective thinking

7) Preventive equipment maintenance is an example of:
A) prevention costs
B) appraisal costs
C) internal failure costs
D) external failure costs
Answer: A
Diff: 1
Terms: prevention costs
Objective: 1
AACSB: Reflective thinking

8) Spoilage is an example of:
A) prevention costs
B) appraisal costs
C) internal failure costs
D) external failure costs
Answer: C
Diff: 2
Terms: internal failure costs
Objective: 1
AACSB: Reflective thinking
9) A liability claim is an example of:
A) prevention costs
B) appraisal costs
C) internal failure costs
D) external failure costs
Answer: D
Diff: 2
Terms: external failure costs
Objective: 1
AACSB: Reflective thinking

10) Design engineering is an example of:
A) prevention costs
B) appraisal costs
C) internal failure costs
D) external failure costs
Answer: A
Diff: 2
Terms: external failure costs
Objective: 1
AACSB: Reflective thinking

11) Rework is an example of:
A) prevention costs
B) appraisal costs
C) internal failure costs
D) external failure costs
Answer: C
Diff: 2
Terms: external failure costs
Objective: 1
AACSB: Reflective thinking
Monticello Furniture manufactures expensive tables. Its varnishing department is fully automated and requires substantial inspection to keep the machines operating properly. An improperly varnished table is very expensive to correct. Inspection hours for the 5,000 tables varnished in September totaled 1,250 hours by 8 employees. Eight quarts of varnish were used, on average, for each table. The standard amount of varnish per table is nine quarts. The cost of inspection for September was equal to the budgeted amount of $38,000.

12) The $38,000 represents a(n):
A) activity cost pool
B) possible cost allocation base
C) internal failure cost
D) work-in-process control
Answer: A
Diff: 2
Terms: costs of quality (COQ)
Objective: 1
AACSB: Analytical skills

13) What is the inspection cost per unit?
A) $30.40
B) $7.60
C) $3,800
D) $4,000
Answer: B
Explanation: B) Rate per unit = $38,000/5,000 units = $7.60 per unit
Diff: 3
Terms: costs of quality (COQ)
Objective: 1
AACSB: Analytical skills

14) Cost of quality reports usually do NOT consider:
A) external failure costs
B) opportunity costs
C) internal failure costs
D) appraisal costs
Answer: B
Diff: 2
Terms: costs of quality (COQ)
Objective: 1
AACSB: Reflective thinking
15) Examples of opportunity costs include:
A) lost sales
B) forgone contribution margin
C) lower production
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: costs of quality (COQ)
Objective: 1
AACSB: Reflective thinking

16) The cost of quality measure has all of the following advantages EXCEPT:
A) being a useful measure of comparing different quality improvement projects
B) serving as a common denominator for evaluating trade-offs among prevention and failure costs
C) focusing on how costly poor quality can be
D) being in existence in almost every production circumstance
Answer: D
Diff: 2
Terms: costs of quality (COQ)
Objective: 1
AACSB: Reflective thinking

17) Shortening delivery times is a minor part of the quality improvement process.
Answer: FALSE
Explanation: Shortening delivery times is a major part of the quality improvement process.
Diff: 2
Terms: quality
Objective: 1
AACSB: Analytical skills

18) ISO 9000 developed by the International Organization for Standardization is a set of five international standards for quality management adopted by more than 85 countries.
Answer: TRUE
Diff: 2
Terms: quality
Objective: 1
AACSB: Multiculturalism and diversity

19) Quality is defined as the total features and characteristics of a product or a service made or performed according to specifications to satisfy customers at the time of purchase and during use.
Answer: TRUE
Diff: 2
Terms: quality
Objective: 1
AACSB: Ethical reasoning
20) Conformance quality is the performance of a product or service relative to its design and product specifications.
Answer: TRUE
Diff: 2
Terms: conformance quality
Objective: 1
AACSB: Analytical skills

21) In the banking industry, depositing a customer's check into the wrong bank account is an example of quality of design failure.
Answer: FALSE
Explanation: This is an example of conformance quality failure.
Diff: 2
Terms: conformance quality
Objective: 1
AACSB: Communication

22) Costs of quality (COQ) reports usually do NOT consider opportunity costs.
Answer: TRUE
Diff: 2
Terms: costs of quality (COQ)
Objective: 1
AACSB: Analytical skills

23) Design quality refers to the performance of a product or service relative to its design and product specification.
Answer: FALSE
Explanation: Conformance quality refers to the performance of a product or service relative to its design and product specification.
Diff: 2
Terms: design quality, conformance quality
Objective: 1
AACSB: Analytical skills

24) Costs of Quality (COQ) are classified into four categories: prevention costs, appraisal costs, inspection costs, and warranty costs.
Answer: FALSE
Explanation: Costs of Quality (COQ) are classified into four categories: prevention costs, appraisal costs, internal failure costs, and external failure costs.
Diff: 2
Terms: costs of quality (COQ)
Objective: 1
AACSB: Analytical skills
25) Appraisal costs are costs incurred to preclude the production of products that do NOT conform to specifications
   Answer: FALSE
   Explanation: Prevention costs are costs incurred to preclude the production of products that do not conform to specifications
   Diff: 2
   Terms: prevention, appraisal, internal failure, and external failure costs
   Objective: 1
   AACSB: Analytical skills

26) Internal failure costs are costs incurred on defective products after they have been shipped to customers
   Answer: FALSE
   Explanation: External failure costs are costs incurred on defective products after they have been shipped to customers
   Diff: 2
   Terms: prevention, appraisal, internal failure, and external failure costs
   Objective: 1
   AACSB: Analytical skills

27) When evaluating alternatives to improve quality, both the relevant benefits as well as the relevant costs should be considered.
   Answer: TRUE
   Diff: 1
   Terms: quality
   Objective: 1
   AACSB: Analytical skills

28) Prevention costs include inspection and product testing.
   Answer: TRUE
   Diff: 1
   Terms: quality
   Objective: 1
   AACSB: Ethical reasoning

29) Warranty costs are an example of internal failure costs.
   Answer: FALSE
   Explanation: Warranty costs are an example of external failure costs.
   Diff: 2
   Terms: Balanced Scorecard
   Objective: 1
   AACSB: Communication
30) Write a paragraph outlining how a manufacturer of personal computers such as Dell Computer can benefit from the introduction of a quality improvement program.
Answer: A quality improvement program for Dell would result in substantial savings in operating costs and higher revenues. Operating costs would be reduced since fewer funds would be spent checking output and correcting defective products. Higher revenues would result since existing customers would likely increase their orders and the higher quality output would attract additional customers. In addition, a number of competitors will likely be implementing quality programs. Dell must meet the competition to succeed.
Diff: 1
Terms: quality
Objective: 1
AACSB: Reflective thinking

31) The two basic aspects of quality are quality of design and conformance quality. Define and give an example of each.
Answer: Quality of design measures how closely the characteristics of products or services meet the needs and wants of customers. For example, customers of photocopying machines want copiers that combine copying, faxing, scanning, and electronic printing. If the photocopy machines fail to meet these customer needs, sales will fall.
Conformance quality refers to the performance of a product or service according to design and product specifications. For example, if a photocopy machine constantly has paper jams or breaks down, it fails to satisfy conformance quality.
Diff: 1
Terms: design quality, conformance quality
Objective: 1
AACSB: Reflective thinking
32) The Door Company manufactures doors. Classify each of the following quality costs as prevention costs, appraisal costs, internal failure costs, or external failure costs.

a. Retesting of reworked products
b. Downtime due to quality problems
c. Analysis of the cause of defects in production
d. Depreciation of test equipment
e. Warranty repairs
f. Lost sales arising from a reputation for poor quality
g. Quality circles
h. Rework direct manufacturing labor and overhead
i. Net cost of spoilage
j. Technical support provided to suppliers
k. Audits of the effectiveness of the quality system
l. Plant utilities in the inspection area
m. Reentering data because of keypunch errors

_________ Prevention costs
_________ Appraisal costs
_________ Internal failure costs
_________ External failure costs

Answer:
g, j _______ Prevention costs
d, l, k _______ Appraisal costs
a, b, c, h, i, m Internal failure costs
e, f, m _______ External failure costs

Diff: 3

Terms: prevention, appraisal, internal failure, and external failure costs
Objective: 1
AACSB: Reflective thinking
33) Dawn and Kim just bought a bed and breakfast inn at a very attractive price. The business had been doing poorly. Before they reopened the inn for business, they attended a seminar on operating a high quality business. Now that they are ready to open the inn, they need some advice on quality costs and management.

Required:
Identify four categories of quality costs. In addition, identify three items that would be classified in each of the categories.

Answer:
Prevention: Hiring employees with good references
Training of owners and employees
Good security
Good reservation system
Purchasing quality furniture

Appraisal: Verifying accuracy of reservation and registration procedures
Inspecting rooms, facilities, building and grounds regularly
Observing activities of employees
Testing furniture and fixtures
Taste testing food

Internal failure: Recleaning rooms and facilities
Restocking rooms with linens, glasses, etc.
Out-of-stock supplies
Reinspection
Failure to bill on a timely basis

External failure: Responding to complaints about rooms and food
Responding to complaints about reservations
Emergency cleaning of rooms when not ready on time
Customer refunds because of unsatisfactory conditions
Opportunity cost of lost revenue resulting from unhappy customers

Diff: 3
Terms: prevention, appraisal, internal failure, and external failure costs
Objective: 1
AACSB: Ethical reasoning
34) Wilson's Language School manufactures CDs and DVDs to teach English as a Second Language. Wilson has just prepared a Cost of Quality Report, and the staff has noticed a decline in prevention costs as a percentage of total sales over a three-year period. What changes might Wilson expect to see in appraisal costs as a percentage of sales, internal failure costs as a percentage of sales, and external failure costs as a percentage of sales given this trend?

Answer: Most likely, the decline in prevention costs as a percentage of sales over a three-year period would result in increased internal and external failure costs as a percentage of sales during this same period. The reduced prevention activities might result in more defective products. Appraisal costs as a percentage of sales might also rise as management attempts to compensate for the higher failure rates by increasing inspection and appraisal costs to prevent defects from reaching the final customer.

Diff: 3
Terms: prevention, appraisal, internal failure, and external failure costs
Objective: 1
AACSB: Reflective thinking

35) A quality improvement program is very costly to implement across a large corporation. Why do they do it? Explain.

Answer: (Answers may vary.)
A focus on quality within an organization will have the long run benefit of reducing costs and increasing customer satisfaction.

The corporation must consider four key cost of quality areas where costs are most likely to occur: (1) prevention costs - which arise when the product does not meet the specifications, (2) appraisal costs - incurred by actions which must be taken to detect which of the individual units of products do not conform with the specification(s), (3) internal failure costs - incurred on defective products before they are shipped to customers, and (4) external failure costs - incurred on defective products after they are shipped to customers.

Any company which does not invest in quality improvement by constantly reviewing, revising, and implementing procedures to maintain focus on the four key cost of quality areas will be almost certain to have lower profits, revenues, and market share.

Diff: 3
Terms: quality, prevention, appraisal, internal failure, and external failure costs
Objective: 1
AACSB: Ethical reasoning
Objective 19.2

1) An example of a nonfinancial measure for customer satisfaction is:
   A) delivery delay
   B) employee turnover
   C) number of defects on the production line
   D) process yield
   Answer: A
   Diff: 3
   Terms: quality
   Objective: 2
   AACSB: Reflective thinking

2) An example of a nonfinancial measure for customer satisfaction is:
   A) Average manufacturing time for key products
   B) Contribution margin
   C) Percentage of products that fail soon after delivery
   D) Number of employees trained on managing bottleneck operations
   Answer: C
   Diff: 3
   Terms: quality
   Objective: 2
   AACSB: Reflective thinking

3) A graph of a series of successive observations of a particular step, procedure, or operation taken at regular intervals of time is a:
   A) control chart
   B) Pareto diagram
   C) cause-and-effect diagram
   D) fishbone diagrams
   Answer: A
   Diff: 2
   Terms: control chart
   Objective: 2
   AACSB: Reflective thinking

4) Statistical quality control includes a control chart that:
   A) graphs a series of random events of a process
   B) plots each observation relative to specified ranges that represent the expected distribution
   C) plots control observations over various periods of time
   D) plots only those observations outside specified limits
   Answer: B
   Diff: 2
   Terms: control chart
   Objective: 2
   AACSB: Reflective thinking
5) When using a control chart, a manager does NOT investigate the activity when:
A) all observations are outside the preset range
B) some observations are outside the preset range
C) all observations are within the range of preset standard deviations
D) almost all observations are within the range of two standard deviations
Answer: C
Diff: 2
Terms: control chart
Objective: 2
AACSB: Reflective thinking

6) A tool which indicates how frequently each type of defect occurs is a:
A) control chart
B) Pareto diagram
C) cause-and-effect diagram
D) fishbone diagrams
Answer: B
Diff: 2
Terms: Pareto diagram
Objective: 2
AACSB: Reflective thinking

7) A tool which identifies potential causes of failures or defects is a:
A) control chart
B) Pareto diagram
C) cause-and-effect diagram
D) None of these answers is correct.
Answer: C
Diff: 2
Terms: cause-and-effect diagram
Objective: 2
AACSB: Reflective thinking

8) When considering customer needs and wants, only financial measures can be used, since they are easily measured.
Answer: FALSE
Explanation: When considering customer needs and wants, both financial as well as nonfinancial measures can be used.
Diff: 1
Terms: quality
Objective: 2
AACSB: Ethical reasoning

9) An example of a nonfinancial measure of customer satisfaction would be the percentage of products that fail soon after delivery.
Answer: TRUE
Diff: 2
Terms: Balanced Scorecard
Objective: 2
AACSB: Communication
10) A measurement of market share is considered a financial measure of customer satisfaction.
Answer: FALSE
Explanation: A measurement of market share is considered a nonfinancial measure of customer satisfaction.
Diff: 3
Terms: Balanced Scorecard, customer satisfaction
Objective: 2
AACSB: Ethical reasoning

11) A control chart identifies potential causes of failures or defects.
Answer: FALSE
Explanation: A cause and effect chart identifies potential causes of failures or defects.
Diff: 2
Terms: control chart, cause-and-effect diagram
Objective: 2
AACSB: Ethical reasoning

12) When using a control chart, the observations outside the upper and lower product specification limits are ordinarily regarded as non random and worth investigating.
Answer: FALSE
Explanation: When using a control chart, the observations outside the upper and lower control limits are ordinarily regarded as non random and worth investigating.
Diff: 2
Terms: control chart, cause-and-effect diagram
Objective: 2
AACSB: Analytical skills

13) A cause-and-effect diagram is used to help identify potential causes of defects.
Answer: TRUE
Diff: 2
Terms: cause-and-effect diagram
Objective: 2
AACSB: Analytical skills

14) A Pareto Diagram is usually in a bar-chart format, and it shows how often a particular problem has occurred.
Answer: TRUE
Diff: 1
Terms: Pareto diagram
Objective: 2
AACSB: Analytical skills

15) Six Sigma emphasizes incremental rather than dramatic or disruptive innovation.
Answer: TRUE
Diff: 2
Terms: six-sigma
Objective: 2
AACSB: Communication
16) The number of design and process changes made to improve design quality or reduce costs of quality is a type of nonfinancial quality measure.
Answer:  TRUE
Diff: 2
Terms:  quality
Objective:  2
AACSB:  Analytical skills

17) Discuss the methods used to identify quality problems.
Answer:
1. A control chart is a graph of a series of successive observations of a particular step, procedure, or operation taken at regular intervals of time.

2. A Pareto diagram indicates how frequently each type of failure (defect) occurs.

3. A cause-and-effect diagram helps to identify potential causes of failures or defects.
Diff: 2
Terms:  quality, control chart, Pareto diagram, cause-and-effect diagram
Objective:  2
AACSB:  Reflective thinking

18) A corporation can measure its quality performance by using financial or nonfinancial measures of quality. Discuss the merits of each method and whether the use of one precludes the use of the other.
Answer:  Financial measures of quality are quantifiable. The business can calculate the costs of setting up quality control systems, the costs of noncompliance with quality in terms of the internal and external costs (rework, warranty costs, etc.), and estimate the revenues lost as a result of quality problems.

Nonfinancial measures of quality are useful indicators of future long-run performance. They are helpful in revealing future needs and preferences of customers and in indicating the specific areas that need improvement.

The use of one measure does not preclude the use of the other. Financial measures tend to be short term in nature (what is happening now). Nonfinancial measures tend to be long term and are useful in terms of estimating trends.

Financial performance measures are more readily available than nonfinancial measures, but they are no more important to the overall goals of the organization. By considering nonfinancial measures, the organization can improve operational control. Superior financial performance usually follows from superior nonfinancial performance.
Diff: 2
Terms:  quality
Objective:  2
AACSB:  Reflective thinking
19) Design Products is committed to its quality program. It works with all areas of the company to establish sound quality programs within reasonable budget guidelines. For 2011, it has budgeted $1,000,000 for prevention costs and $700,000 for appraisal costs. Internal failure has a budget of $100 per failed item, while external failure has a total budget of $600,000.

Product Testing has proposed to management a change in the 2011 budget for a new method of testing products. If management decides to implement the new method, $2 per unit of appraisal costs will be saved, up to a level of 200,000 tests. No additional savings are expected past the 200,000 level. The new method involves $90,000 in training costs and $60,000 in yearly testing supplies.

Traditionally, 3% of all completed items have to be reworked. External failure costs average $120 per failed unit. The company's average external failures are 1% of units sold. The company carries no ending inventories.

**Required:**

a. What is the adjusted budget for appraisal costs, assuming the new method is implemented and 800,000 units are tested during the manufacturing process in 2011?

b. How much do internal failure costs change, assuming 600,000 units are tested under the new method and it reduces the amount of unacceptable units in the manufacturing process by 40%?

c. What would be the change in the external failure budget, assuming external failures are reduced by 60% and the same facts as in part (b)?

**Answer:**

\[
\begin{array}{c|c}
\text{Current Budget} & \$ 700,000 \\
\text{Additions: Training} & \$90,000 \\
\text{Additions: Supplies} & 60,000 \\
\text{Savings: } 200,000 \times \$2 & (400,000) \\
\text{Adjusted budget} & \$ 450,000 \\
\end{array}
\]

\[
\begin{array}{c|c}
\text{Current budget } \$100 \times 0.03 \times 600,000 = & \$1,800,000 \\
\text{Savings rate } & \times 0.40 \\
\text{Net savings (reduction in internal failure costs)} & \$ 720,000 \\
\end{array}
\]

\[
\begin{array}{c|c}
\text{Current budget } \$120 \times 0.01 \times 600,000 = & \$720,000 \\
\text{Savings rate } & \times 0.60 \\
\text{Net savings (reduction in external failure costs)} & \$ 432,000 \\
\end{array}
\]

Diff: 2

Terms: COQ; prevention, appraisal, internal failure, and external failure costs

Objective: 2

AACSB: Analytical skills
20) The Custom Shirt House is concerned about its declining sales, especially the reduction in the number of customers. For the last two years, its shirts have won industry awards for high quality and trend-setting styles. At the latest executive managers' meeting, everyone was blaming everyone else for the decline. After much discussion and presenting some fact-finding information, it was determined that sales relationships were the cause of most of the problems.

**Required:**
What may be some of the causes and how can the causes be detected if product quality is not an issue?
**Answer:** The causes may be the lack of customer satisfaction with sales staff (poor sales skills), delivery problems (not on time), accounting problems (poor billing and collection procedures), or poor returns and allowance policies.

The causes may be detected by comparing nonfinancial measures of the company with those found in the industry. These might include measures of: number of shipments incorrect or not on time; number of customer complaints about certain areas (billing, shipping, etc.); response time to customer complaints; or a questionnaire about why former customers quit buying from the company.

**Diff:** 2  
**Terms:** quality  
**Objective:** 2  
**AACSB:** Reflective thinking

21) Baby Care Products has just completed a very successful program of improving quality in its manufacturing operations. The next step is to improve the operations of its administrative functions, starting with the accounting information system. As the manager of the accounting operations, you are requested to begin a quality improvement program.

**Required:**
What are some possibilities of finding out about the current status of quality in the accounting system?
**Answer:** The manager might begin by identifying "customer" needs. Then the manager might use one of the methods of identifying quality problems. Statistical quality control helps to distinguish between random variation and nonrandom variation. A control chart of observations usually accompanies this. Another method is the use of a Pareto diagram. This indicates how frequently each type of failure occurs. Also, cause-and-effect diagrams help to identify potential causes of failure. A fishbone diagram is often used here to identify multiple causes of failure. Quality of design could potentially be the biggest problem.

**Diff:** 2  
**Terms:** quality  
**Objective:** 2  
**AACSB:** Communication
22) Three tools used to detect quality problems include control charts, Pareto charts, and cause and effect diagrams. Briefly explain each of these tools.

Answer: A control chart is a graph of a series of successive observations of a particular step, procedure, or operation taken at regular intervals of time. These charts might indicate when a process is out of control by comparing observations to statistically determined upper and lower level control limits.

A Pareto diagram indicates how frequently each type of failure (defect) occurs. Usually Pareto diagrams use a bar-chart format.

A cause-and-effect diagram helps to identify potential causes of failures or defects. It is also known as a fishbone diagram, and groups the various causes into categories of similar causes.

Diff: 2
Terms: control charts, Pareto charts, cause and effect diagrams
Objective: 2
AACSB: Reflective thinking

Objective 19.3

1) Regarding the means by which relevant costs and benefits are evaluated when evaluating quality improvement, the key question is:
   A) which alternative solution will make the customer happiest
   B) how total costs and total revenues will change under each alternative solution
   C) will the employees of the company be able to implement the change
   D) how long will it take for the improvement program to be fully functional

Answer: B

Diff: 2
Terms: relevant costs, relevant revenues
Objective: 3
AACSB: Reflective thinking

Answer the following questions using the information below:

Tri-State Manufacturing expects to spend $800,000 in 2012 in appraisal costs if it does not change its incoming materials inspection method. If it decides to implement a new receiving method, it will save $80,000 in fixed appraisal costs and variable costs of $0.40 per unit of finished product. The new method involves $120,000 in training costs and an additional $160,000 in annual equipment rental. It takes two units of material for each finished product.

Internal failure costs average $160 per failed unit of finished goods. During 2011, 5% of all completed items had to be reworked. External failure costs average $400 per failed unit. The company's average external failures are 1% of units sold. The company carries no ending inventories, because all jobs are on a per order basis and a just-in-time inventory ordering method is used.
2) What is the net effect on appraisal costs for 2012, assuming the new receiving method is implemented and that 800,000 material units are received?

A) $120,000 increase
B) $120,000 decrease
C) $400,000 decrease
D) $400,000 increase

Answer: B

Diff: 2
Terms: appraisal costs, costs of quality (COQ)
Objective: 3
AACSB: Analytical skills

3) How much will internal failure costs change, assuming 800,000 units of materials are received and that the new receiving method reduces the amount of UNACCEPTABLE product units in the manufacturing process by 10%?

A) $40,000 increase
B) $50,000 decrease
C) $160,000 decrease
D) $320,000 decrease

Answer: C

Explanation:

C) Internal failure costs \[ \left( \frac{800,000}{4} \right) \times 0.05 \times 160 \times 0.10 \]

Savings \[ \$1,600,000 \times 0.10 \]

\[ \$160,000 \]

Diff: 3
Terms: internal failure costs, costs of quality (COQ)
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

LaCrosse Products has a budget of $900,000 in 2012 for prevention costs. If it decides to automate a portion of its prevention activities, it will save $80,000 in variable costs. The new method will require $40,000 in training costs and $100,000 in annual equipment costs. Management is willing to adjust the budget for an amount up to the cost of the new equipment. The budgeted production level is 150,000 units.

Appraisal costs for the year are budgeted at $600,000. The new prevention procedures will save appraisal costs of $50,000. Internal failure costs average $15 per failed unit of finished goods. The internal failure rate is expected to be 3% of all completed items. The proposed changes will cut the internal failure rate by one-third. Internal failure units are destroyed. External failure costs average $54 per failed unit. The company's average external failures average 3% of units sold. The new proposal will reduce this rate by 50%. Assume all units produced are sold and there are no ending inventories.

4) What is the net change in the budget of prevention costs if the procedures are automated in 2012? Will management agree with the changes?
A) $60,000 decrease, yes
B) $60,000 increase, yes
C) $140,000 increase, no
D) $80,000 decrease, yes
Answer:  B
Explanation:
B) New costs:

<table>
<thead>
<tr>
<th>Training</th>
<th>$40,000</th>
<th>New equipment</th>
<th>$140,000</th>
</tr>
</thead>
</table>

Savings

<table>
<thead>
<tr>
<th>Variable costs</th>
<th>$100,000</th>
</tr>
</thead>
</table>

Net increase in budget

$ 60,000

Diff: 3
Terms: prevention costs, costs of quality (COQ)
Objective: 3
AACSB: Analytical skills

5) How much will appraisal costs change assuming the new prevention methods reduce material failures by 40% in the appraisal phase?
A) $140,000 decrease
B) $60,000 increase
C) $50,000 decrease
D) $22,500 decrease
Answer:  C
Explanation:  C) Savings in appraisal costs is $50,000
Diff: 2
Terms: appraisal costs, costs of quality (COQ)
Objective: 3
AACSB: Analytical skills
6) How much will internal failure costs change if the internal product failures are reduced by 1/3 with the new procedures?
   A) $22,500 decrease
   B) $67,500 decrease
   C) $500,000 decrease
   D) $750,000 decrease
   Answer: A
   Explanation:
   A) Internal failure rate \(150,000 \times 0.03\) \(4,500\)
   Cost per unit \(\times 15\)
   Total \$67,500\)
   Savings rate \(\times \frac{1}{3}\)
   Savings \$22,500\)
   Diff: 2
   Terms: internal failure costs, costs of quality (COQ)
   Objective: 3
   AACSB: Analytical skills

7) How much do external failure costs change if all changes are as anticipated with the new prevention procedures? Assume all units produced are sold and there are no ending inventories.
   A) $121,500 decrease
   B) $121,500 increase
   C) $243,000 decrease
   D) None of these answers is correct.
   Answer: A
   Explanation:
   A) External failure costs \(150,000 \times 0.03 \times 54\) \$243,000\)
   Savings rate \(\times 0.50\)
   Savings \$121,500\)
   Diff: 3
   Terms: external failure costs, costs of quality (COQ)
   Objective: 3
   AACSB: Analytical skills

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8) Management has offered to allow the prevention changes if all changes take place as anticipated and the amounts netted are less than the cost of the equipment. What is the net impact of all the changes created by the preventive changes?

A) $140,000
B) $(22,500)
C) $(134,000)
D) $(121,500)

Answer: C

Explanation:

C) Training Costs $40,000
Equipment Costs 100,000 140,000

Savings
Prevention $(80,000)
Appraisal 50,000
Internal failure costs 22,500
External failure costs 121,500 274,000
Net Savings $(134,000)

Diff: 3
Terms: costs of quality (COQ)
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

Dylan Products has a budget of $1,200,000 in 2011 for prevention costs. If it decides to automate a portion of its prevention activities, it will save $90,000 in variable costs. The new method will require $40,000 in training costs and $150,000 in annual equipment costs. Management is willing to adjust the budget for an amount up to the cost of the new equipment. The budgeted production level is 210,000 units.

Appraisal costs for the year are budgeted at $500,000. The new prevention procedures will save appraisal costs of $50,000. Internal failure costs average $20 per failed unit of finished goods. The internal failure rate is expected to be 4% of all completed items. The proposed changes will cut the internal failure rate by one-half. Internal failure units are destroyed. External failure costs average $48 per failed unit. The company's average external failures average 2.5% of units sold. The new proposal will reduce this rate to 1%. Assume all units produced are sold and there are no ending inventories.

9) What is the net change in the budget of prevention costs if the procedures are automated in 2011? Will management agree with the changes?
   A) $100,000 decrease, yes
   B) $90,000 decrease, yes
   C) $190,000 increase, no
   D) $100,000 increase, yes
   Answer: D
   Explanation: D) New costs: Training $40,000, New equipment $150,000. Savings $90,000. Net increase in budget $100,000.
   Diff: 3
   Terms: prevention costs, costs of quality (COQ)
   Objective: 3
   AACSB: Analytical skills

10) How much will appraisal costs change assuming that the new prevention methods reduce material failures by 30% in the appraisal phase?
    A) $150,000 decrease
    B) $229,000 decrease
    C) $50,000 increase
    D) $50,000 decrease
    Answer: D
    Explanation: D) The new prevention procedures will save appraisal costs of $50,000.
    Diff: 2
    Terms: appraisal costs, costs of quality (COQ)
    Objective: 3
    AACSB: Analytical skills
11) How much will internal failure costs change if the internal product failures are reduced by 50% with the new procedures?
   A) $168,000 decrease
   B) $126,000 decrease
   C) $ 84,000 decrease
   D) $ 84,000 increase
   Answer: C
   Explanation:
   C) Internal failure rate (210,000 × 0.04) 8,400
   Cost per unit × $20
   Total $168,000
   Savings rate × 0.50
   Savings $84,000
   Diff: 3
   Terms: internal failure costs, costs of quality (COQ)
   Objective: 3
   AACSB: Analytical skills

12) How much do external failure costs change if all the changes are as the new prevention procedures anticipated? Assume all units produced are sold and there are no ending inventories.
   A) $126,000 decrease
   B) $151,200 decrease
   C) $100,800 decrease
   D) None of these answers is correct.
   Answer: B
   Diff: 3
   Terms: external failure costs, costs of quality (COQ)
   Objective: 3
   AACSB: Analytical skills

13) Management has offered to allow the prevention changes if all changes take place as anticipated and the amounts netted are less than the cost of the equipment. What is the net impact of all the changes created by the preventive changes?
   A) $185,200
   B) $(185,200)
   C) $(134,200)
   D) $(279,200)
   Answer: B
   Explanation:
   B) Prevention changes, net $ 100,000
   Appraisal changes, net (50,000)
   Internal failure changes, net (84,000)
   External failure changes, net (151,200)
   Net of all changes $(185,200)
   Diff: 3
   Terms: costs of quality (COQ)
   Objective: 3
   AACSB: Analytical skills
14) An important difference between financial measures of quality and nonfinancial measures of quality is that:
A) financial measures of quality tend to be useful indicators of future long-term performance, while nonfinancial measures have more of a short-term focus
B) nonfinancial measures of quality tend to be useful indicators of future long-term performance, while financial measures of quality have more of a short-term focus
C) nonfinancial measures are generally too subjective to have any long-term value
D) None of these answers is correct.
Answer: B
Diff: 3
Terms: quality
Objective: 3
AACSB: Reflective thinking

15) Examples of nonfinancial measures of quality include the:
A) percentage of defective units shipped to customers as a percentage of total units shipped
B) number of customer complaints
C) percent of products that experience early or excessive failure
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: quality
Objective: 3
AACSB: Reflective thinking

16) Nonfinancial measures of quality are of limited use by themselves. They are more informative when they are:
A) combined with trend analysis
B) used with the half-life depreciation method
C) used with nonroutine financial data
D) None of these answers is correct.
Answer: A
Diff: 2
Terms: quality
Objective: 3
AACSB: Reflective thinking

17) A DISADVANTAGE of nonfinancial measures of quality include that they are:
A) often difficult to quantify
B) often difficult to understand
C) not useful indicators of future long-run performance
D) None of these answers is correct.
Answer: D
Diff: 2
Terms: quality
Objective: 3
AACSB: Reflective thinking
18) Allocated cost amounts are an important determinant of the costs of a quality improvement program.
Answer: FALSE
Explanation: Allocated costs are usually ignored in calculating the costs of a quality improvement program.
Diff: 2
Terms: costs of quality (COQ)
Objective: 3
AACSB: Analytical skills

19) Most companies expend a substantial amount of dollars measuring the financial costs of design quality.
Answer: FALSE
Explanation: Most companies do not expend a substantial amount of dollars measuring the financial costs of design quality.
Diff: 2
Terms: costs of quality (COQ), design quality
Objective: 3
AACSB: Ethical reasoning

20) The financial cost of quality measures serves as a common denominator for evaluating trade-offs among prevention costs and failure costs.
Answer: TRUE
Diff: 2
Terms: costs of quality (COQ)
Objective: 3
AACSB: Analytical skills

21) Nonfinancial measures of quality are often difficult to quantify and easy to understand.
Answer: FALSE
Explanation: Nonfinancial measures of quality are often easy to quantify and easy to understand.
Diff: 2
Terms: quality
Objective: 3
AACSB: Analytical skills

22) Cost of Quality financial measures will usually deteriorate when nonfinancial measures of quality are emphasized and improved.
Answer: FALSE
Explanation: Financial cost of quality measures and nonfinancial measures complement each other.
Diff: 2
Terms: quality
Objective: 3
AACSB: Analytical skills

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23) Discuss the means by which a company goes about evaluating and installing a new quality improvement program.

Answer:
1. The managers will have previously identified the quality problems by using analytical tools such as control charts, pareto diagrams, and cause and effect diagrams.
2. The managers will then develop various solution options for improvement and project how total costs and total revenues for the company will change under each alternative solution. Once having done this analysis, they will select and implement the optimal solution.
3. The managers will then establish and implement nonfinancial measures of internal business process quality in order to assure the ongoing success of the solution that has been put in place. These measures include percentage of defective products, percentage of reworked products, and others.
4. The managers will then establish and implement measures of learning and growth perspective for quality improvements. These include such measures as employee turnover, employee training, and others. This will encourage a continual focus on quality within the corporation.

Diff: 2
Terms: relevant revenues, relevant costs, qualitative factors
Objective: 3
AACSB: Ethical reasoning

24) Little Dog Unlimited makes small motorcycles. The monthly demand ranges from 80 to 100 motorcycles. The average demand is 92 motorcycles. The plant operates 300 hours a month. Each cycle takes approximately 1.5 hours.

If the company adds a new line of scooters, initial demand will be 20 per month. Each scooter will take 1 hour to make. To offset approaching production capacity, expanding the assembly line is possible. This will decrease manufacturing time for all products by 20%. However, this will increase the costs of cycles from $400 to $500 and scooters from $200 to $240. The change will also cause increases in prices from $700 to $750 for cycles and from $450 to $500 for scooters.

Required:

a. What is the average waiting time for cycles if they are the only item manufactured?

b. What are the average waiting times if both cycles and scooters are produced and the assembly line is not enlarged?

c. What are the average waiting times if both cycles and scooters are produced and the assembly line is enlarged?

d. What is the expected monthly margin without scooters if the company sells all 92 cycles it manufactures?

e. What are the expected monthly contribution margins if scooters are made with the current assembly line and with the new assembly line? Assume average sales and that sales equal production.

f. What action do you recommend?
Answer:
a. Waiting time = \[ \frac{[92 \times (1.5)^2]}{[2 \times [300 \text{ hr. a month} - (92 \times 1.5)]]} = 0.639 \text{ hours} \]

b. \[ \text{WT} = \frac{(92 \times (1.5)^2) + (20 \times 1)}{[2 \times [300 - (92 \times 1.5) - (20 \times 1)]]} = \frac{227}{284} = 0.799 \text{ hours} \]

c. \[ \text{WT} = \frac{(92 \times (1.2)^2) + (20 \times (0.8)^2)}{[2 \times [300 - (92 \times 1.2) - (20 \times 0.8)]]} = \frac{145.28}{347.2} = 0.418 \text{ hours} \]

d. Expected monthly margin without scooters:

| Motorcycle sales (92 × $700) | $64,400  
| Manufacturing costs (92 × $400) | 36,800  
| Expected margin | $27,600 |

e. Without changing assembly line:

| Motorcycle sales (92 × $700) | $64,400  
| Scooter sales (20 × $450) | 9,000  
| Total expected sales | 73,400  
| Manufacturing costs: 
  | Motorcycles (92 × $400) | $36,800  
  | Scooters (20 × $200) | 4,000  
| Expected margin | $32,600 |

With new assembly line:

| Motorcycle sales (92 × $750) | $69,000  
| Scooter sales (20 × $500) | 10,000  
| Total expected sales | 79,000  
| Manufacturing costs: 
  | Motorcycles (92 × $500) | $46,000  
  | Scooters (20 × $240) | 4,800  
| Expected margin | $28,200 |

f. Unless there are critical customer relation problems with a slower response time, the scooters should be added without changing the assembly line. The expected margin is $4,400 higher without the new assembly line ($32,600 - $28,200).

Diff: 3
Terms: average waiting time
Objective: 3
AACSB: Analytical skills
Objective 19.4

Answer the following questions using the information below:

Tri-State Manufacturing expects to spend $800,000 in 2012 in appraisal costs if it does not change its incoming materials inspection method. If it decides to implement a new receiving method, it will save $80,000 in fixed appraisal costs and variable costs of $0.40 per unit of finished product. The new method involves $120,000 in training costs and an additional $160,000 in annual equipment rental. It takes two units of material for each finished product.

Internal failure costs average $160 per failed unit of finished goods. During 2011, 5% of all completed items had to be reworked. External failure costs average $400 per failed unit. The company's average external failures are 1% of units sold. The company carries no ending inventories, because all jobs are on a per order basis and a just-in-time inventory ordering method is used.

1) How much will external failure costs change assuming 800,000 units of materials are received and that product failures with customers are cut in half with the new receiving method?
   A) $20,000 increase
   B) $400,000 decrease
   C) $640,000 decrease
   D) $800,000 decrease
   Answer: B
   Explanation:
   B) External failure \((800,000/4) \times 1\% \times $400\) $800,000
   Failure reduction of 50% \(\times 0.50\)
   Savings \(\$400,000\)
   Diff: 3
   Terms: external failure costs, costs of quality (COQ)
   Objective: 4
   AACSB: Analytical skills

2) The amount of time from when a customer places an order for a product or requests a service to when the product or service is delivered to the customer is referred to as:
   A) manufacturing lead time
   B) bottleneck
   C) customer-response time
   D) a time driver
   Answer: C
   Diff: 2
   Terms: customer-response time
   Objective: 4
   AACSB: Reflective thinking
3) The amount of time from when an order is ready to start on the production line to when it becomes a finished good is referred to as:
   A) manufacturing lead time
   B) bottleneck
   C) customer-response time
   D) a time driver
   Answer: A
   Diff: 2
   Terms: manufacturing lead time
   Objective: 4
   AACSB: Reflective thinking

4) Companies that use manufacturing lead time as the base for allocating manufacturing costs to products consider that it has the following benefit(s):
   A) Managers are motivated to reduce the time taken to manufacture products.
   B) Total overhead costs decrease.
   C) Operating income rises.
   D) All of these answers are correct.
   Answer: D
   Diff: 1
   Terms: manufacturing lead time
   Objective: 4
   AACSB: Reflective thinking

5) Any factor where a change in the factor causes a change in the speed with which an activity is undertaken is referred to as:
   A) a time driver
   B) a bottleneck
   C) manufacturing lead time
   D) customer-response time
   Answer: A
   Diff: 2
   Terms: time driver
   Objective: 4
   AACSB: Reflective thinking

6) ________ is an operation where the work to be performed approaches or exceeds the available capacity.
   A) A bottleneck
   B) A time driver
   C) Customer-response time
   D) Manufacturing lead time
   Answer: A
   Diff: 1
   Terms: bottleneck
   Objective: 4
   AACSB: Reflective thinking
7) In the formula to calculate the average waiting time, the manufacturing time is squared because:
A) the shorter the manufacturing time, the less the chance that the machine will be in use when an order arrives
B) the shorter the manufacturing time, the greater the chance that the machine will be in use when an order arrives
C) the longer the manufacturing time, the greater the chance that the machine will be in use when an order arrives
D) the longer the manufacturing time, the less the chance the machine will be in use when an order arrives
Answer: C
Diff: 3
Terms: average waiting time
Objective: 4
AACSB: Reflective thinking

8) For a fast-food restaurant, the average waiting time might be formulated as:

A) \[
\frac{[(\text{average number of customers}) \times (\text{average serving time})^2]}{2 \times [\text{serving capacity} - (\text{avg. # of customers} \times \text{avg. serving time})]}
\]

B) \[
\frac{[(\text{average number of customers}) \times (\text{average serving time})^2]}{\text{capacity}}
\]

C) \[
\frac{[(\text{average customers per hour}) \times (\text{average serving time})^2]}{60 \text{ minutes}}
\]

D) \[
\frac{[(\text{average customers per hour}) \times (\text{average serving time})^2]}{(60 \text{ minutes}) \times (\text{number of workers})}
\]

Answer: A
Diff: 3
Terms: average waiting time
Objective: 4
AACSB: Analytical skills
Answer the following questions using the information below:

Kay's Window Company has a variable demand. Historically, its demand has ranged from 20 to 40 windows per day with an average of 30. Kay Ballard works eight hours a day, five days a week. Each order is one window and each window takes 13 minutes.

9) What is the average waiting time, in minutes?
A) 1.6  
B) 4.4  
C) 28.2  
D) 56.3  
Answer: C  
Diff: 3  
Terms: average waiting time  
Objective: 4  
AACSB: Analytical skills

10) What is the cycle time for an order?
A) 13 minutes per window  
B) 28.2 minutes per window  
C) 41.2 minutes per window  
D) 390 minutes per day  
Answer: C  
Explanation: C) Waiting minutes = \[\frac{30 \times (13^2)}{2 \times [480 \text{ minutes per day} - (30 \times 13)]}\]  
\[= 28.16 \text{ minutes}\]  
Cycle time = waiting time + manufacturing time = 28.16 + 13 = 41.16  
Diff: 3  
Terms: average waiting time, manufacturing cycle time  
Objective: 4  
AACSB: Analytical skills

11) Kay plans to add doors to its product line and anticipates that they will average 5 doors per day. Each door takes 12 minutes to install.  
What is the average waiting time, in minutes, if Kay continues to be the only worker?
A) 60.0 minutes  
B) 390.0 minutes  
C) 96.5 minutes  
D) 720.0 minutes  
Answer: C  
Explanation: C) \[ WT = \frac{(30\times(13)^2) + (5\times(12)^2)}{2\times[480 - (30\times13) - (5\times12)]} \]  
\[= 5,790/60 = 96.5 \text{ minutes}\]  
Diff: 3  
Terms: average waiting time  
Objective: 4  
AACSB: Analytical skills
Answer the following questions using the information below:

The tool crib at a large manufacturing company is responsible for providing tools to the factory workers on demand. The tool crib has a variable demand. Historically, its demand has ranged from 300 to 500 small tools per day with an average of 400. Diane, the tool crib attendant, works eight hours a day, five days a week. Each order is for one small tool and each small tool takes Diane 1 minute to retrieve from the bins.

12) What is the average waiting time, in minutes?
A) 1
B) 1.5
C) 2.5
D) 3.5
Answer: C
Explanation: 
C) Waiting minutes = \[400 \times (1 \text{ squared})] / \{[2 \times [480 \text{ minutes per day} - (400 \times 1)]}\} = 2.5 \text{ minutes} 
Diff: 3 
Terms: average waiting time 
Objective: 4 
AACSB: Analytical skills

13) What is the cycle time for an order?
A) 1 minutes per tool
B) 1.5 minutes per tool
C) 2.5 minutes per tool
D) 3.5 minutes per tool
Answer: D
Diff: 3 
Terms: average waiting time, manufacturing cycle time 
Objective: 4 
AACSB: Analytical skills

14) Diane has been asked to consider plans to add the retrieval of larger tooling fixtures to her duties. She anticipates that there would be an average of 12 tooling fixtures per day requested. Each tooling fixture would take Diane 4 minutes to retrieve.

What is the average waiting time, in minutes, if Diane continues to be the only worker that would retrieve the small tools as well as the larger tooling fixtures?
A) 3.50 minutes
B) 7.00 minutes
C) 9.25 minutes
D) 64.00 minutes
Answer: C 
Explanation: C) WT = \[\frac{(400 \times (1)^2) + (12 \times (4)^2)}{2 \times [480 - (400 \times 1) - (12 \times 4)]}\] = 592/64 = 9.25 minutes 
Diff: 3 
Terms: average waiting time 
Objective: 4 
AACSB: Analytical skills
15) Two common operational measures of time are customer-response time and manufacturing lead time.
Answer: FALSE
Explanation: The two are customer-response time and on-time performance.
Diff: 2
Terms: customer-response time, manufacturing lead time
Objective: 4
AACSB: Communication

16) Customer-response time is a measure of how long it takes for the customer to return a call.
Answer: FALSE
Explanation: Customer response time is how long it takes from the time a customer places an order for a product or service to the time the product or service is delivered to the customer.
Diff: 2
Terms: customer-response time
Objective: 4
AACSB: Communication

17) Manufacturing lead time is the sum of waiting time and manufacturing time for an order.
Answer: TRUE
Diff: 2
Terms: manufacturing lead time
Objective: 4
AACSB: Reflective thinking

18) Two important drivers of time are limited capacity and bottlenecks.
Answer: FALSE
Explanation: The drivers of time are uncertainty and limited capacity (also known as bottleneck).
Diff: 2
Terms: time driver
Objective: 4
AACSB: Reflective thinking

19) The average waiting time is the average amount of time an order will wait at the company's shipping office before it is sent to the customer.
Answer: FALSE
Explanation: The average waiting time is the average amount of time that an order will wait in line before it is set up and processed.
Diff: 2
Terms: average waiting time
Objective: 4
AACSB: Reflective thinking
20) Manufacturing Cycle Efficiency (MCE) = Value-added Manufacturing Time divided by
Manufacturing Cycle Time
Answer: TRUE
Diff: 1
Terms: manufacturing cycle efficiency
Objective: 4
AACSB: Analytical skills

21) Norton's Convenience store has a variable demand. The daily demand ranges from 270 to 330
customers a day who average purchasing 5 items each. The average daily demand is 300 customers. The
convenience store currently operates 12 hours a day. Each order takes approximately 2 minutes.

**Required:**
a. What is the average customer waiting time, in minutes?

b. What is the cycle time for an order?

c. Norton has decided that the waiting time is too long and has increased the hours the store is open to
15 hours. What is the waiting time now?

**Answer:**
a. Waiting minutes = \[\frac{300 \times (2)}{2 \times (720 \text{ minutes per day} - (300 \times 2))} = 5 \text{ minutes}\]

b. Cycle time = waiting time + processing time = 5 + 2 = 7 minutes

c. Waiting minutes = \[\frac{300 \times (2)}{2 \times (900 \text{ minutes per day} - 300 \times 2))} = 2 \text{ minutes}\]

Diff: 2
Terms: average waiting time
Objective: 4
AACSB: Analytical skills
22) Brown Laundry has a variable demand. The daily demand ranges from 100 to 140 customers a day with an average of 5 items. The average daily demand is 110 customers. The laundry operates 10 hours a day. Each order takes approximately 5 minutes.

**Required:**

a. What is the average customer waiting time, in minutes?

b. What is the cycle time for an order?

c. The manager has decided that the waiting time is too long and has increased the workday to 11 hours. What is the waiting time now? Will the customers be any happier?

**Answer:**

a. Waiting minutes = \[\frac{110 \times (5) \times 2}{2 \times [600 \text{ minutes per day} - (110 \times 5)]}\] = 27.5 minutes

b. Cycle time = waiting time + processing time = 27.5 + 5 = 32.5 minutes

c. Waiting minutes = \[\frac{110 \times (5) \times 2}{2 \times [660 \text{ minutes per day} - (110 \times 5)]}\] = 12.5 minutes

The customers are probably not much happier unless they change the time when they stop by the laundry. If the customers now fill the 11-hour day, the new reduced waiting time will be a definite improvement.

**Diff:** 2  
**Terms:** average waiting time  
**Objective:** 4  
**AACSB:** Analytical skills

23) Acme Janitor Service has always taken pride in the fact that it had one of the highest customer response times in the home cleaning service industry. However, as the products manufactured for this industry have become more complex, the company’s customer response time has declined.

**Required:**

Why do you think that response time declined if all other quality factors have remained the same?

**Answer:** If quality production was one of the other control factors, and the products became more complex, it probably takes more time to inspect and verify the quality of the finished products. Therefore, to maintain the same level of quality, additional time had to be put into the product cycle. Apparently this was not allowed for in setting the production times of the newer, more complex products.

**Diff:** 2  
**Terms:** customer-response time  
**Objective:** 4  
**AACSB:** Reflective thinking
Objective 19.5

1) The theory of constraints is used for cost analysis when:
A) a manufacturing company produces multiple products and uses multiple manufacturing facilities and/or machines
B) using a long-term time horizon
C) operating costs are assumed fixed
D) All of these answers are correct.
Answer: A
Diff: 2
Terms: theory of constraints (TOC)
Objective: 5
AACSB: Reflective thinking

2) Throughput contribution equals revenues minus:
A) direct material and direct labor costs
B) direct material costs and minus operating costs
C) direct material costs of goods sold
D) operating costs
Answer: C
Diff: 2
Terms: throughput contribution
Objective: 5
AACSB: Reflective thinking

3) In the theory of constraints, the only direct costs are:
A) investment costs
B) direct material
C) direct material and direct labor
D) direct material, direct labor, and variable overhead costs
Answer: B
Diff: 3
Terms: theory of constraints (TOC)
Objective: 5
AACSB: Reflective thinking

4) Keeping the bottleneck operation busy and subordinating all nonbottleneck operations to the bottleneck operation involves:
A) maximizing the contribution margin of the nonbottleneck operation
B) keeping the bottleneck resource busy at least 90% of the time
C) having the workers at the nonbottleneck operation or machine improving their productivity
D) None of these answers is correct.
Answer: D
Diff: 2
Terms: theory of constraints (TOC), bottleneck
Objective: 5
AACSB: Communication
5) Producing more nonbottleneck output:
A) creates more inventory, but does not increase throughput contribution
B) creates more inventory and increases throughput contribution
C) creates less pressure for the bottleneck workstations
D) allows for the maximization of overall contribution
Answer: A
Diff: 2
Terms: theory of constraints (TOC), bottleneck
Objective: 5
AACSB: Reflective thinking

Answer the following questions using the information below:

Speedy Dress Manufacturing has two workstations, cutting and finishing. The cutting station is limited by the speed of operating the cutting machine. Finishing is limited by the speed of the workers. Finishing normally waits for work from cutting. Each department works an eight-hour day. If cutting begins work two hours earlier than finishing each day, the two departments generally finish their work at about the same time. Not only does this eliminate the bottleneck, but also it increases finished units produced each day by 160 units. All units produced can be sold even though the change increases inventory stock by 20% from 400 units. The cost of operating the cutting department two more hours each day is $1,600. The contribution margin of the finished products is $6 each. Inventory carrying costs are $0.40 per unit per day.

6) What is the total production per day if the change is made?
A) 6400 units
B) 800 units
C) 880 units
D) 1600 units
Answer: B
Explanation: B) Units per hour = 160/2 = 80 units per day = 80 × 10 = 800 units
Diff: 1
Terms: theory of constraints (TOC), bottleneck
Objective: 5
AACSB: Analytical skills
7) What is the change in the daily contribution margin if the change is made?
   A) $(608)
   B) $(634)
   C) $(672)
   D) $800
   Answer:  C
   Explanation:
   C) Units per hour = 160/2 = 80 units per day = 80 × 10 = 800 units

   Total contribution margin (160 × $6) $ 960
   Carrying cost (80 units × $0.40) (32)
   Increased costs (1,600)
   Net change in contribution margin $ (672)

   Diff: 3
   Terms:  theory of constraints (TOC), bottleneck
   Objective:  5
   AACSB:  Analytical skills

   Answer the following questions using the information below:

   Captain Carl's Seascapes produces sea pictures for sale through catalogs. The company has two
   workstations, photo production and framing. The photo production station is limited by the speed of
   operating the photo development machine. Framing is limited by the speed of the employees. Framing
   normally waits for work from photo production. Each department works an eight-hour day. If Captain
   Carl's Seascapes adds an earlier half shift so that photo production begins work four hours earlier than
   framing each day, the two departments generally finish their work at about the same time. Not only does
   this eliminate the bottleneck, but it also increases finished units produced each day by 200 units. All
   units produced can be sold. The cost of operating the photo production department four more hours each
day is $1,250. The contribution margin of the finished products is $10 each.

   8) What is the total production per day if the change is made?
   A) 50 units
   B) 200 units
   C) 400 units
   D) 600 units
   Answer:  D
   Explanation:  D) Units per hour = 200/4= 50 units per hour:  50 × 12 = 600 units per day
   Diff: 1
   Terms:  theory of constraints (TOC), bottleneck
   Objective:  5
   AACSB:  Analytical skills
9) What is the change in the daily contribution margin if the change is made?
A) $250  
B) $750  
C) $2,000  
D) $800  
Answer: B  
Diff: 3  
Terms: theory of constraints (TOC), bottleneck  
Objective: 5  
AACSB: Analytical skills

10) The Glass Shop, a manufacturer of large windows, is experiencing a bottleneck in its plant. Setup time at one of its workstations has been identified as the culprit. A manager has proposed a plan to reduce setup time at a cost of $72,000. The change will result in 8,000 additional windows. The selling price per window is $18, direct labor costs are $3 per window, and the cost of direct materials is $5 per window. Assume all units produced can be sold. The change will result in an increase in the throughput contribution of:
A) $104,000  
B) $80,000  
C) $32,000  
D) $8,000  
Answer: A  
Explanation: A) 8,000 × ($18 - $5) = $104,000  
Diff: 3  
Terms: throughput contribution  
Objective: 5  
AACSB: Analytical skills

11) The theory of constraints describes methods to maximize operating income when faced with some bottleneck and some nonbottleneck operations.  
Answer: TRUE  
Diff: 2  
Terms: theory of constraints (TOC)  
Objective: 5  
AACSB: Analytical skills

12) Throughput contribution is equal to revenues minus direct material and direct labor costs.  
Answer: FALSE  
Explanation: Throughput contribution is equal to revenues minus the direct materials cost of goods sold.  
Diff: 2  
Terms: throughput contribution  
Objective: 5  
AACSB: Reflective thinking
13) When considering the theory of constraints, operating costs refer to all costs involved in the manufacturing process.
Answer: FALSE
Explanation: When considering the theory of constraints, all costs except for direct materials are considered operating costs.
Diff: 3
Terms: theory of constraints (TOC)
Objective: 5
AACSB: Reflective thinking

14) The theory of constraints considers a short-run time horizon and assumes operating costs are fixed.
Answer: TRUE
Diff: 2
Terms: costs of quality (COQ), bottleneck
Objective: 5
AACSB: Analytical skills

15) When a firm has a bottleneck machine, a good way to manage the bottleneck is to make sure that prior machines produce more units for the bottleneck machine to increase its throughput.
Answer: FALSE
Explanation: When a firm has a bottleneck machine, making sure that prior machines produce more units for the bottleneck machine will not increase throughput of the bottleneck machine.
Diff: 3
Terms: theory of constraints (TOC)
Objective: 5
AACSB: Analytical skills
16) Brix, Inc., prepares frozen food for fast-food restaurants. It has two workstations, cooking and assembly. The cooking station is limited by the cooking time of the food. Assembly is limited by the speed of the workers. Assembly normally waits on food from cooking. Because the demand has increased in recent months to 2,800 dozen units, management is considering adding another cooking station or else having the cooks start to work earlier. The monthly cost of operating the cooking station one more hour each day is $2,400. The cost of adding another cooking station would add an average of $10 per hour. The current operating hours total eight hours a day, 22 days a month. The contribution margin of the finished products is currently $8 per dozen. Inventory carrying costs average $2.00 per dozen per month. Either the extra hour or the new cooking station would increase production by 20 dozen a day, with a long-run increase of 80 dozen units in finished goods inventory to 280 dozen.

**Required:**

**a.** What is the total production per month if the change is made?

**b.** What is the increase in the expected monthly product contribution for each of the possible changes?
Assume long-run production equals sales.

**Answer:**

**a.** Total dozen per month = 2,800 + (22 × 20) = 3,240

**b.**

| Current product contribution margin (2,800 x $8) | $22,400 |
| Carrying costs (200 x $2) | (400) |
| Current net contribution | $22,000 |

**More hours:**

| Expected product contribution margin (3,240 x $8) | $25,920 |
| Carrying costs (280 x $2) | $ 560 |
| Increased costs | 2,400 (2,960) |
| Expected net product contribution | $22,960 |
| Increase = $22,960 - $22,000 = | $ 960 |

**New cooking station:**

| Expected product contribution margin (3,240 x $8) | $25,920 |
| Carrying costs (280 x $2) | $ 560 |
| Increased costs ($10 x 22 x 8) | 1,760 (2,320) |
| Expected net product contribution | $23,600 |
| Increase = $23,600 - $22,000 = | $ 1,600 |

**Diff: 2**

Terms: theory of constraints (TOC), bottleneck
Objective: 5
AACSB: Analytical skills
17) Aunt Lydia's Cookies, Inc., prepares frozen gourmet cookies for shipment to upscale grocery stores as well as mailing to web and catalog customers. The company has two workstations, cooking and distribution. The cooking station is limited by the cooking time of the food. Distribution is limited by the speed of the workers. Distribution normally waits on food from cooking. Because the demand has increased in recent months to 4,000 dozen cookies, management is considering adding another oven in the cooking station or else having the cooks start to work earlier. The monthly cost of operating the cooking station one more hour each day is $1,500. The cost of adding another cooking station would add an average of $8 per hour. The current operating hours total eight hours a day, 24 days a month. The contribution margin of the finished products is currently $2 per dozen. Inventory carrying costs average $0.50 per dozen per month. Either the extra hour or the new cooking station would increase production by 50 dozen a day, with a long-run increase of 100 dozen units in finished goods inventory to 500 dozen.

**Required:**

a. What is the total production per month if the change is made?

b. What is the increase in the expected monthly product contribution for each of the possible changes? Assume long-run production equals sales.

c. What course of action would you recommend?

**Answer:**

a. Total dozen per month = 4,000 + (24 × 50) = 5,200

b.  

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| **Current product contribution margin (4,000 x $2)** | $8,000  
| **Carrying costs (400 x $0.50)**           | (200)  
| **Current net contribution**                   | $7,800  

**More hours:**

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| **Expected unit contribution margin (5,200 x $2)** | $10,400  
| **Carrying costs (500 x $0.50)**           | $ 250  
| **Increased costs**                   | 1,500 (1,750)  
| **Expected net product contribution**                   | $8,650  

Increase = $8,650 - $7,800 = $ 850

**New oven in the cooking station:**

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| **Expected unit contribution margin (5,200 x $2)** | $10,400  
| **Carrying costs (500 x $0.50)**           | $ 250  
| **Increased costs ($8 x 24 x 8)**            | 1,536 (1,786)  
| **Expected net product contribution**                   | $8,614  

Increase = $8,614 - $7,800 = $814
c. The most cost effective option is to have the cooks start to work an hour earlier and work an extra hour each day.

Diff: 2

Terms: theory of constraints (TOC), bottleneck

Objective: 5

AACSB: Analytical skills

18) The Alpha Beta Corporation experiences numerous instances of constraints hindering the effective operation of their manufacturing process. Identify the methods that might be used to maximize operating income, and minimize the effect of the constraints.

Answer: A manager's objective should be to increase throughput contribution (revenues minus direct material costs) while decreasing investments and operating costs. The manager should consider adjusting the product mix to maximize the total contribution margin. Another possibility is subcontracting out part of the production process. Quality considerations should be paramount, since a defective unit, or one that has to be reworked, is in effect replacing a unit that could be sold.

Diff: 1

Terms: theory of constraints (TOC)

Objective: 5

AACSB: Reflective thinking

19) A machine has been identified as a bottleneck and the source of the constraint for a manufacturing company that has multiple products and multiple machines. Discuss ways the company can overcome the bottleneck.

Answer: The ways include:

a. Eliminating idle time at the bottleneck operation. Extra staffing at the bottleneck would be a possibility, particularly if numerous manual type tasks were involved.

b. Concentrate on processing those parts or products that increase throughput contribution, not parts or products that remain in finished goods or spare parts inventories.

c. Shift a part of the products produced at the bottleneck machine to other machines or outsource part of the production.

d. Solicit the opinions of the factory workers for ideas as to how the design of the manufacturing process can be simplified.

e. Improve the quality of the production process. Poor quality is especially costly at a bottleneck operation.

Diff: 3

Terms: theory of constraints (TOC), bottleneck

Objective: 5

AACSB: Reflective thinking
20) The last step of the five-step decision making process is implementing the decision, evaluating performance, and learning. How can a balanced scorecard play a role in helping to assure this final step will be successful?

Answer: Using the balanced scorecard and tracking changes in the time-based measures can assess whether or not the financial performance of the company is meeting or exceeding the company's goals.

If the goals are not being met, then decisions and plans can be modified as required to meet the goals.

The balanced scorecard is used to track the financial, customer, internal business processes, and learning and growth measures of the company.

Since there are cause-and-effect linkages and relationships among many of the various measures within the financial and nonfinancial scorecard categories, it is very beneficial for the managers to keep abreast of the measures and how they are changing over time so that a timely response can be made to avert problems as soon as possible.

Diff: 3
Terms: Balanced Scorecard
Objective: 5
AACSB: Reflective thinking
Objective 20.1

1) Which of the following industries would have the highest cost of goods sold percentage relative to sales?
   A) computer manufacturers
   B) retail organizations
   C) drug manufacturers
   D) The percentage will usually depend on the success of a particular company.
   Answer: B
   Diff: 2
   Terms: inventory management
   Objective: 1
   AACSB: Reflective thinking

2) The costs of goods acquired from suppliers including incoming freight or transportation costs are:
   A) purchasing costs
   B) ordering costs
   C) stockout costs
   D) carrying costs
   Answer: A
   Diff: 2
   Terms: purchasing costs
   Objective: 1
   AACSB: Reflective thinking

3) The costs of preparing, issuing, and paying purchase orders, plus receiving and inspecting the items included in orders is:
   A) purchasing costs
   B) ordering costs
   C) stockout costs
   D) carrying costs
   Answer: B
   Diff: 2
   Terms: ordering costs
   Objective: 1
   AACSB: Reflective thinking
4) The costs that result from theft of inventory are:
A) shrinkage costs
B) external failure costs
C) stockout costs
D) costs of quality
Answer: A
Diff: 2
Terms: shrinkage
Objective: 1
AACSB: Reflective thinking

5) The costs that result when a company runs out of a particular item for which there is a customer demand are:
A) shrinkage costs
B) shortage costs
C) stockout costs
D) EOQ estimation costs
Answer: C
Diff: 2
Terms: stockout costs
Objective: 1
AACSB: Reflective thinking

6) The costs that result when features and characteristics of a product or service are NOT in conformance with the specifications are:
A) inspection costs
B) costs of quality
C) purchasing costs
D) design costs
Answer: B
Diff: 2
Terms: stockout costs
Objective: 1
AACSB: Reflective thinking

7) The costs that result when a company holds an inventory of goods for sale:
A) purchasing costs
B) carrying costs
C) opportunity costs
D) interest costs
Answer: B
Diff: 2
Terms: stockout costs
Objective: 1
AACSB: Reflective thinking
8) Quality costs include:
A) purchasing costs  
B) ordering costs  
C) stockout costs  
D) prevention costs  
Answer: D  
Diff: 2  
Terms: quality costs  
Objective: 1  
AACSB: Reflective thinking

Answer the following questions using the information below:

The following information applies to Labs Plus, which supplies microscopes to laboratories throughout the country. Labs Plus purchases the microscopes from a manufacturer which has a reputation for very high quality in its manufacturing operation.

Annual demand (weekly demand=1/52 of annual demand)  20,800 units  
Orders per year  20  
Lead time in days  15 days  
Cost of placing an order  $100

9) What is the reorder point?  
A) 1,040 units  
B) 857 units  
C) 1,560 units  
D) 2,080 units  
Answer: B  
Explanation: B) 20,800/52 = 400/7 = 57.14 daily demand × 15 = 857.1  
Diff: 2  
Terms: reorder point  
Objective: 1  
AACSB: Analytical skills

10) Retailers generally have a high percentage of net income to revenues.  
Answer: FALSE  
Explanation: Retailers have a low percentage of net income to revenues.  
Diff: 2  
Terms: inventory management  
Objective: 1  
AACSB: Analytical skills

11) Inventory management is the planning, organizing, and controlling activities that focus on the flow of materials into, through, and from the organization.  
Answer: TRUE  
Diff: 2  
Terms: inventory management  
Objective: 1  
AACSB: Analytical skills
12) Purchasing costs arise in preparing and issuing purchase orders, receiving and inspecting the items included in the orders, and matching invoices received, purchase orders, and delivery records to make payments.
Answer: FALSE
Explanation: Ordering costs arise in preparing and issuing purchase orders, receiving and inspecting the items included in the orders, and matching invoices received, purchase orders, and delivery records to make payments.
Diff: 2
Terms: purchasing costs
Objective: 1
AACSB: Analytical skills

13) The opportunity cost of the stockout includes lost contribution margin on the sale NOT made plus any contribution margin lost on future sales due to customer ill will.
Answer: TRUE
Diff: 2
Terms: stockout costs
Objective: 1
AACSB: Analytical skills

14) Carrying costs arise when an organization experiences an ability to deliver its goods to its customers.
Answer: FALSE
Explanation: Carrying costs arise when an organization holds its goods for sale.
Diff: 2
Terms: carrying costs
Objective: 1
AACSB: Analytical skills

15) Shrinkage is measured by adding (a) the cost of the inventory recorded on the books in the absence of theft and other incidents just mentioned, and (b) the cost of inventory when physically counted.
Answer: FALSE
Explanation: Shrinkage is measured by the difference between (a) the cost of the inventory recorded on the books in the absence of theft and other incidents just mentioned, and (b) the cost of inventory when physically counted.
Diff: 2
Terms: shrinkage
Objective: 1
AACSB: Analytical skills

16) Shrinkage costs result from theft by outsiders, embezzlement by employees, misclassifications, and clerical errors.
Answer: TRUE
Diff: 2
Terms: shrinkage
Objective: 1
AACSB: Analytical skills
17) All inventory costs are available in financial accounting systems.
Answer: FALSE
Explanation: Opportunity costs are rarely recorded in formal accounting systems and they are often a very significant cost component.
Diff: 2
Terms: shrinkage
Objective: 1
AACSB: Analytical skills

18) Sharing inventory data throughout the supply chain leads to more "rush" orders occurring.
Answer: FALSE
Explanation: Sharing inventory data throughout the supply chain leads to fewer "rush" orders occurring.
Diff: 2
Terms: inventory management
Objective: 1
AACSB: Analytical skills
Managing inventories to increase net income requires companies to effectively manage costs associated with goods for sale.

**Required:**

Classify the below listed items as either **Purchasing Costs**, **Ordering Costs**, **Carrying Costs**, **Stockout Costs**, **Costs of Quality**, or **Shrinkage Costs**.

- a. costs of obtaining purchase approvals
- b. costs resulting from embezzlement by employees
- c. internal failure costs
- d. opportunity cost of the investment tied up in inventory
- e. spoilage of stored items
- f. costs of lost sales as a result of not having an item requested by a customer
- g. costs of incoming freight
- h. costs of matching invoices received to the items and the purchase orders
- i. costs of wages for work-in-process inspections
- j. costs that result from clerical errors

**Answer:**

- a. Ordering Costs
- b. Shrinkage Costs
- c. Costs of Quality
- d. Carrying Costs
- e. Carrying Costs
- f. Stockout Costs
- g. Purchasing Costs
- h. Ordering Costs
- i. Costs of Quality
- j. Shrinkage Costs

**Diff:** 2

**Terms:** costs associated with goods for sale

**Objective:** 1

**AACSB:** Analytical skills
Objective 20.2

1) Obsolescence is an example of which cost category?
A) carrying costs
B) labor costs
C) ordering costs
D) quality costs
Answer: A
Diff: 2
Terms: carrying costs
Objective: 2
AACSB: Reflective thinking

2) The costs associated with storage are an example of which cost category?
A) quality costs
B) labor costs
C) ordering costs
D) carrying costs
Answer: D
Diff: 2
Terms: carrying costs
Objective: 2
AACSB: Reflective thinking

3) Which of the following is an assumption of the economic-order-quantity decision model?
A) The quantity ordered can vary at each reorder point.
B) Demand ordering costs and carrying costs fluctuate.
C) There will be timely labor costs.
D) No stockouts occur.
Answer: D
Diff: 2
Terms: economic order quantity (EOQ)
Objective: 2
AACSB: Reflective thinking

4) The economic order quantity ignores:
A) purchasing costs
B) relevant ordering costs
C) stockout costs
D) Both A and C are correct.
Answer: D
Diff: 3
Terms: economic order quantity (EOQ)
Objective: 2
AACSB: Reflective thinking
5) The purchase-order lead time is the:
A) difference between the times an order is placed and delivered
B) difference between the products ordered and the products received
C) discrepancies in purchase orders
D) time required to correct errors in the products received
Answer: A
Diff: 2
Terms: purchase-order lead time
Objective: 2
AACSB: Reflective thinking

6) Which of the following statements about the economic-order-quantity decision model is FALSE?
A) It assumes purchasing costs are relevant when the cost per unit changes due to the quantity ordered.
B) It assumes quality costs are irrelevant if quality is unaffected by the number of units purchased.
C) It assumes stockout costs are irrelevant if no stockouts occur.
D) It assumes ordering costs and carrying costs are relevant.
Answer: A
Diff: 3
Terms: economic order quantity (EOQ)
Objective: 2
AACSB: Reflective thinking

7) Relevant total costs in the economic-order-quantity decision model equal relevant ordering costs plus relevant:
A) carrying costs
B) stockout costs
C) quality costs
D) purchasing costs
Answer: A
Diff: 2
Terms: economic order quantity (EOQ), ordering costs, carrying costs
Objective: 2
AACSB: Reflective thinking
Answer the following questions using the information below:

The Wood Furniture company produces a specialty wood furniture product, and has the following information available concerning its inventory items:

- Relevant ordering costs per purchase order: $300
- Required annual return on investment: 10%
- Required other costs per year: $2.80
- Annual demand is 20,000 packages per year. The purchase price per package is $32.

8) What is the economic order quantity?
   A) 2,000,000 units
   B) 1,414.21 units
   C) 150,000 units
   D) 3,464.00 units
   Answer: B
   Explanation: B) Unit carrying costs = ($32 × 0.10) + $2.80 = $6
   EOQ = The square root of \[
   \frac{2 \times 20,000 \times $300}{$6}\] = 1,414.21 units
   Diff: 3
   Terms: economic order quantity (EOQ)
   Objective: 2
   AACSB: Analytical skills

9) What are the relevant total costs at the economic order quantity?
   A) $1,414.21
   B) $4,242.65
   C) $8,485.28
   D) $9,000.00
   Answer: C
   Explanation: C) Unit carrying costs = ($32 × 0.10) + $2.80 = $6
   EOQ = The square root of \[
   \frac{2 \times 20,000 \times $300}{$6}\] = 1,414.21 units
   RTC = \[
   \frac{($20,000 \times $300)}{1,414.21} + \frac{(1,414.21 \times $6)}{2}\] = $8,485.28
   Diff: 3
   Terms: economic order quantity (EOQ), ordering costs, carrying costs
   Objective: 2
   AACSB: Analytical skills
10) What are the total relevant costs, assuming the quantity ordered equals 1,000 units?
A) $3,000
B) $500
C) $6,000
D) $9,000
Answer:  D
Explanation:  D) RTC = \[ \left( \frac{$20,000 \times $300}{1,000} \right) + \left( \frac{1,000 \times $6}{2} \right) \] = $9,000
Diff: 3
Terms:  economic order quantity (EOQ), ordering costs, carrying costs
Objective:  2
AACSB:  Analytical skills

11) How many deliveries will be required at the economic order quantity?
A) 1.00 delivery
B) 5.10 deliveries
C) 7.07 deliveries
D) 14.14 deliveries
Answer:  D
Explanation:  D) \( \frac{20,000}{1,414.21} = 14.14 \) deliveries
Diff: 3
Terms:  economic order quantity (EOQ)
Objective:  2
AACSB:  Analytical skills

12) The annual relevant total costs are at a minimum when relevant:
A) ordering costs are greater than the relevant carrying costs
B) carrying costs are greater than the relevant ordering costs
C) carrying costs are equal to relevant ordering costs
D) None of these answers is correct.
Answer:  C
Diff: 3
Terms:  economic order quantity (EOQ), ordering costs, carrying costs
Objective:  2
AACSB:  Reflective thinking
Answer the following questions using the information below:

The following information applies to Labs Plus, which supplies microscopes to laboratories throughout the country. Labs Plus purchases the microscopes from a manufacturer which has a reputation for very high quality in its manufacturing operation.

Annual demand (weekly demand = 1/52 of annual demand) 20,800 units
Orders per year 20
Lead time in days 15 days
Cost of placing an order $100

13) What are the annual relevant carrying costs, assuming each order was made at the economic-order-quantity amount?
A) $200
B) $1,000
C) $2,000
D) $6,000
Answer: C
Explanation: C) Annual carrying costs = annual ordering costs = $100 × 20 = $2,000
Diff: 2
Terms: economic order quantity (EOQ), carrying costs
Objective: 2
AACSB: Analytical skills

14) What is the economic order quantity assuming each order was made at the economic-order-quantity amount?
A) 15 units
B) 20 units
C) 780 units
D) 1,040 units
Answer: D
Diff: 2
Terms: economic order quantity (EOQ)
Objective: 2
AACSB: Analytical skills

15) If Brian Company has a safety stock of 320 units and the average daily demand is 20 units, how many days can be covered if the shipment from the supplier is delayed by 12 days?
A) 24.0 days
B) 20.0 days
C) 16.0 days
D) 13.4 days
Answer: C
Explanation: C) 320/20 = 16 days
Diff: 3
Terms: safety stock, purchase-order lead time
Objective: 2
AACSB: Analytical skills
16) If Jackson Collectibles, Inc. has a safety stock of 70 units and the average weekly demand is 14 units, how many days can be covered if the shipment from the supplier is delayed?
   A) 5 days
   B) 35 days
   C) 42 days
   D) 70 days
   Answer: B
   Explanation: B) 70/2 = 35.0 days
   Diff: 3
   Terms: safety stock, purchase-order lead time
   Objective: 2
   AACSB: Analytical skills

17) The optimal safety stock level is the quantity of safety stock that minimizes the sum of the annual relevant:
   A) stockout costs and carrying costs
   B) ordering costs and carrying costs
   C) ordering costs and stockout costs
   D) ordering costs and purchasing costs
   Answer: A
   Diff: 2
   Terms: economic order quantity (EOQ), safety stock, stockout costs, carrying costs
   Objective: 2
   AACSB: Reflective thinking

18) The simplest version of the Economic Order Quantity model incorporates only ordering costs, carrying costs, and purchasing costs into the calculation.
   Answer: FALSE
   Explanation: Purchasing costs are ignored in the Economic Order Quantity.
   Diff: 2
   Terms: economic order quantity (EOQ)
   Objective: 2
   AACSB: Analytical skills

19) To determine the Economic Order Quantity, the relevant ordering costs are maximized and the relevant carrying costs are minimized.
   Answer: FALSE
   Explanation: We minimize both the relevant ordering costs and the relevant carrying costs.
   Diff: 2
   Terms: economic order quantity (EOQ)
   Objective: 2
   AACSB: Analytical skills
20) The Economic Order Quantity increases with demand and carrying costs and decreases with ordering costs.
Answer: FALSE
Explanation: The Economic Order Quantity increases with demand and ordering costs and decreases with carrying costs.
Diff: 2
Terms: economic order quantity (EOQ)
Objective: 2
AACSB: Analytical skills

21) The EOQ model is solved using calculus but the key intuition is that relevant total costs are minimized when relevant ordering costs equal relevant carrying costs.
Answer: TRUE
Diff: 2
Terms: economic order quantity (EOQ)
Objective: 2
AACSB: Analytical skills

22) Safety stock is used as a buffer against unexpected increases in demand, uncertainty about lead time, and unavailability of stock from suppliers.
Answer: TRUE
Diff: 1
Terms: safety stock
Objective: 2
AACSB: Ethical reasoning
23) Due to unprecedented growth during the year, Flowers by Kelly decided to use some of its surplus cash to increase the size of several inventory order quantities that had been previously determined using an EOQ model.

**Required:**
Identify whether increasing the size of inventory orders will increase, decrease, or have no effect on each of the following items.

<table>
<thead>
<tr>
<th>Item</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Average inventory</td>
<td>Increase</td>
</tr>
<tr>
<td>b. Cost of goods sold</td>
<td>No effect</td>
</tr>
<tr>
<td>c. Number of orders per year</td>
<td>Decrease</td>
</tr>
<tr>
<td>d. Total annual carrying costs</td>
<td>Increase</td>
</tr>
<tr>
<td>e. Total annual carrying and ordering costs</td>
<td>Depends which costs increase/decrease more</td>
</tr>
<tr>
<td>f. Total annual ordering costs</td>
<td>Decrease</td>
</tr>
</tbody>
</table>

**Answer:**
a. Increase  
b. No effect  
c. Decrease  
d. Increase  
e. Depends which costs increase/decrease more  
f. Decrease  

24) The only product of a company has an annual demand of 4,000 units. The cost of placing an order is $20 and the cost of carrying one unit in inventory for one year is $4.

**Required:**
Determine the economic order quantity.

**Answer:** The square root of \( \frac{(2 \times 4,000 \times $20)}{$4} = 200 \) units

**Diff:** 1  
**Terms:** economic order quantity (EOQ), ordering costs, carrying costs  
**Objective:** 2  
**AACSB:** Analytical skills
25) Ralph was in the process of completing the quarterly planning for the purchasing department when a major computer malfunction lost most of his data. For direct material XXX he was able to recover the following:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Average inventory level of XXX</td>
<td>200</td>
</tr>
<tr>
<td>Orders per year</td>
<td>40</td>
</tr>
<tr>
<td>Average daily demand</td>
<td>48</td>
</tr>
<tr>
<td>Working days per year</td>
<td>250</td>
</tr>
<tr>
<td>Annual ordering costs</td>
<td>$4,000</td>
</tr>
<tr>
<td>Annual carrying costs</td>
<td>$6,000</td>
</tr>
</tbody>
</table>

Ralph purchases at the EOQ quantity level.

**Required:**
Determine the annual demand, the cost of placing an order, the annual carrying cost of one unit, and the economic order quantity.

**Answer:**
Annual demand = \(48 \times 250 = 12,000\)
Cost of placing an order = \($4,000/40 = $100\) per order
Carrying cost of one unit = \($6,000/200 = $30\) per unit

EOQ = The square root of \((2 \times 12,000 \times $100)/30 = 283\) units

**Diff:** 3
**Terms:** economic order quantity (EOQ), ordering costs, carrying costs
**Objective:** 2
**AACSB:** Analytical skills
26) Clothes, Inc., has an average annual demand for red, medium polo shirts of 25,000 units. The cost of placing an order is $80 and the cost of carrying one unit in inventory for one year is $25.

**Required:**
a. Use the economic-order-quantity model to determine the optimal order size.

b. Determine the reorder point assuming a lead time of 10 days and a work year of 250 days.

c. Determine the safety stock required to prevent stockouts assuming the maximum lead time is 20 days and the maximum daily demand is 125 units.

**Answer:**
a. The square root of \( \frac{2 \times 25,000 \times \$80}{\$25} \) = 400 units

b. Daily demand = 25,000/250 = 100 units Reorder point = 100 units per day × 10 days = 1,000 units

c.

<table>
<thead>
<tr>
<th>Maximum demand per day</th>
<th>125 units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum lead time</td>
<td>× 20 days</td>
</tr>
<tr>
<td>Maximum lead time demand</td>
<td>2,500 units</td>
</tr>
<tr>
<td>Reorder point without safety stocks</td>
<td>1,000 units</td>
</tr>
<tr>
<td>Safety stock</td>
<td>1,500 units</td>
</tr>
</tbody>
</table>

Diff: 2
Terms: economic order quantity (EOQ), reorder point, safety stock
Objective: 2
AACSB: Analytical skills
27) An inventory item of XYZ Manufacturing has an average daily demand of 10 units with a maximum daily demand of 12 units. The economic order quantity is 200 units. Without safety stocks, the reorder point is 50 units. Safety stocks are set at 94 units.

**Required:**

a. Determine the reorder point with safety stocks.
b. Determine the maximum inventory level.
c. Determine the average lead time.
d. Determine the maximum lead time.

**Answer:**

a. | Reorder point without safety stocks | 50 units |
   | Safety stock                       | 94 units |
   | Reorder point with safety stocks   | 144 units |

b. | Economic-order quantity          | 200 units |
   | Safety stocks                     | 94 units |
   | Maximum inventory level           | 294 units |

c. Average lead time = 50 units at reorder point/10 units a day = 5 days

d. Reorder point with safety stocks is 144
   Maximum demand is 12
   Maximum lead time = 144/12 = 12 days

Diff: 2
Terms: economic order quantity (EOQ), reorder point, safety stock
Objective: 2
AACSB: Analytical skills
28) For supply item ABC, Andrews Company has been ordering 125 units based on the recommendation of the salesperson who calls on the company monthly. A new purchasing agent has been hired by the company who wants to start using the economic-order-quantity method and its supporting decision elements. She has gathered the following information:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual demand in units</td>
<td>250</td>
</tr>
<tr>
<td>Days used per year</td>
<td>250</td>
</tr>
<tr>
<td>Lead time, in days</td>
<td>10</td>
</tr>
<tr>
<td>Ordering costs</td>
<td>$100</td>
</tr>
<tr>
<td>Annual unit carrying costs</td>
<td>$20</td>
</tr>
</tbody>
</table>

**Required:**
Determine the EOQ, average inventory, orders per year, average daily demand, reorder point, annual ordering costs, and annual carrying costs.

**Answer:**

- **EOQ**
  \[
  \text{EOQ} = \sqrt{\frac{2 \times 250 \times $100}{$20}} = 50
  \]
- **Average inventory**
  \[
  \text{Average inventory} = \frac{50}{2} = 25
  \]
- **Orders per year**
  \[
  \text{Orders per year} = \frac{250}{50} = 5
  \]
- **Average daily demand**
  \[
  \text{Average daily demand} = \frac{250}{250} = 1 \text{ unit}
  \]
- **Reorder point**
  \[
  \text{Reorder point} = \frac{10}{1} = 10 \text{ units}
  \]
- **Annual ordering costs**
  \[
  \text{Annual ordering costs} = 5 \times $100 = $500
  \]
- **Annual carrying costs**
  \[
  \text{Annual carrying costs} = 25 \times $20 = $500
  \]

**Diff:** 2

**Terms:** economic order quantity (EOQ), reorder point, ordering costs, carrying costs

**Objective:** 2

**AACSB:** Analytical skills
29) Discuss considerations that should be fully taken into account when developing inventory related relevant costs for use in an economic order quantity (EOQ) model.
Answer: It is crucial that the costs be incremental.
   Consider incremental carrying costs. If they are costs that will change with the quantity of inventory held, then they are relevant. If there are costs that would be unchanged regardless of how much inventory was in the warehouse (such as a clerical salary or material handler who was working at below full capacity), then those costs are not relevant for decision-making purposes. Relevant carrying costs are likely to be costs like shrinkage, breakage, obsolescence, and costs of hiring extra employees (or having existing employees work overtime) if higher levels of inventory will make those costs increase.
   Consider incremental opportunity cost of capital. If there is a decision to carry more inventory, then there will be money spent to purchase the inventory. The opportunity cost of capital is what would the other most beneficial use of the money be if it wasn't needed to purchase the higher level of inventory. It is calculated by multiplying the company's required rate of return by the per unit costs and then by the number of units purchased for the inventory and incurred at the time the units are received.
   Stockout costs require an estimate of the lost contribution margin on sales lost because of a stockout. Ordering costs are only those that change with the numbers of orders placed.

Diff: 2
Terms: economic order quantity (EOQ), ordering costs, carrying costs
Objective: 2
AACSB: Reflective thinking

Objective 20.3

1) Video Images is a distributor of DVDs. Quick-Disk Mart is a local retail outlet which sells blank and recorded DVDs. Quick-Disk Mart purchases tapes from Video Images at $3.00 per DVD. DVDs are shipped in packages of 20. Video Images pays all incoming freight, and Quick-Disk Mart does not inspect the DVDs due to Video Images reputation for high quality. Annual demand is 104,000 DVDs at a rate of 4,000 DVDs per week. Quick-Disk Mart earns 20% on its cash investments. The purchase-order lead time is two weeks. The following cost data are available:

<table>
<thead>
<tr>
<th>Cost Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relevant ordering costs per purchase order</td>
<td>$90.50</td>
</tr>
<tr>
<td>Carrying costs per package per year</td>
<td></td>
</tr>
<tr>
<td>Relevant insurance, materials handling, breakage, etc., per year</td>
<td>$ 4.50</td>
</tr>
</tbody>
</table>

What is the required annual return on investment per package?
A) $60.00
B) $2.50
C) $12.00
D) $0.60
Answer: C
Explanation:
C) 20 DVDs × $3.00 = $60.00
$60.00 × 0.2 = $12.00
Diff: 3
Terms: ordering costs, carrying costs
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

Digital Goods is a distributor of DVDs. DVD Mart is a local retail outlet which sells blank and recorded DVDs. DVD Mart purchases tapes from Digital Goods at $10.00 per DVD; DVDs are shipped in packages of 25. Digital Goods pays all incoming freight, and DVD Mart does not inspect the DVDs due to Digital Goods' reputation for high quality. Annual demand is 208,000 DVDs at a rate of 4,000 DVDs per week. DVD Mart earns 15% on its cash investments. The purchase-order lead time is one week. The following cost data are available:

Relevant ordering costs per purchase order $94.50
Carrying costs per package per year:
  Relevant insurance, materials handling, breakage, etc., per year $ 3.50

2) What is the economic order quantity?
A) 384 packages
B) 475 packages
C) 146 packages
D) 196 packages
Answer: D
Explanation:
D) EOQ = The square root of \([2 \times (208,000/25) \times $94.50) / ($37.50+ $3.50)]\)
EOQ = 196 packages
Diff: 2
Terms: economic order quantity (EOQ)
Objective: 3
AACSB: Analytical skills

3) What are the relevant total costs?
A) $5,697
B) $2,829
C) $8,029
D) $2,868
Answer: C
Diff: 3
Terms: economic order quantity (EOQ), ordering costs, carrying costs
Objective: 3
AACSB: Analytical skills
4) How many deliveries will be made during each time period?
A) 86.7 deliveries
B) 72.0 deliveries
C) 138.0 deliveries
D) 42.1 deliveries
Answer: A
Explanation:
A) EOQ = The square root of \[\frac{(2 \times (208,000/25) \times $94.50)}{($37.50+ $3.50)}\]
EOQ = 196 packages
\[(208,000 / 25) / 196 = 86.7 \text{ deliveries}\]
Diff: 3
Terms: economic order quantity (EOQ)
Objective: 3
AACSB: Analytical skills

Answer the following questions using the information below:

Short Grass Incorporated is a distributor of golf balls. Martin's Golf Supplies is a local retail outlet which sells golf balls. Martin's purchases the golf balls from Short Grass Incorporated at $0.75 per ball; the golf balls are shipped in cartons of 72. Short Grass Incorporated pays all incoming freight, and Martin's Golf Supplies does not inspect the balls due to Short Grass' reputation for high quality. Annual demand is 155,520 golf balls at a rate of 2,991 balls per week. Martin's Golf Supplies earns 12% on its cash investments. The purchase-order lead time is one week. The following cost data are available:

- Relevant ordering costs per purchase order: $125.00
- Carrying costs per carton per year:
  - Relevant insurance, materials handling, breakage, etc., per year: $0.77

5) If Martin's makes an order (1/12 of annual demand) once per month, what are the relevant total costs?
A) $1,500
B) $652.50
C) $2,152.50
D) $3,000.00
Answer: C
Explanation:
C) Order Quantity = Annual Demand / 12 =12,960 balls/month = 180 cartons per month

RTC = Ordering Costs + Carrying Costs

Carrying Cost per carton = price × invest rate + insurance/handling
Carrying Cost per carton = ($0.75 × 72 × 12%) + $0.77 = $7.25

RTC = (12 × $125.00) + ((180/2) × $7.25) =$2,152.50
Diff: 3
Terms: economic order quantity (EOQ), ordering costs, carrying costs
Objective: 3
AACSB: Analytical skills
6) What is the economic order quantity?
   A) 180 cartons
   B) 273 cartons
   C) 270 cartons
   D) 360 cartons
   Answer: B
   Explanation:
   B) Annual Demand / 155,520 / 72 = 2,160 cartons
   Carrying Cost per carton = ($0.75 × 72 × 12%) + $0.77 = $7.25
   EOQ = The square root of [(2 × (155,520/72) × $125.00) / ($7.25)]
   EOQ = 272.9 cartons - round to 273
   Diff: 2
   Terms: economic order quantity (EOQ)
   Objective: 3
   AACSB: Analytical skills

7) Purchasing at the EOQ recommended level, how many deliveries will be made during each time period?
   A) 2 deliveries
   B) 6.0 deliveries
   C) 7.91 deliveries
   D) 12 deliveries
   Answer: C
   Explanation:
   C) Annual Demand / 155,520 / 72 = 2,160 cartons
   Carrying Cost per carton = ($0.75 × 72 × 12%) + $0.77 = $7.25
   EOQ = The square root of [(2 × (155,520/72) × $125.00) / ($7.25)]
   EOQ = 272.9 cartons - round to 273
   Deliveries = Annual Demand / EOQ = 7.91
   Diff: 3
   Terms: economic order quantity (EOQ)
   Objective: 3
   AACSB: Analytical skills
8) Purchasing at the EOQ recommended level, what are the relevant total costs?
A) $1,500.00
B) $1,978.60
C) $989.37
D) $3,000.00
Answer: B
Explanation:
B) Annual Demand / 155,520 / 72 = 2,160 cartons
Carrying Cost per carton = ($.75 × 72 × 12%) + $0.77 = $7.25
EOQ = The square root of [(2 × (155,520/72) × $125.00) / ($7.25)]
EOQ = 272.9 cartons - round to 273
989.37+989.26
RTC = \[
\frac{(155,520/72) \times ($125.00)}{272.9} + \frac{(272.9) \times ($7.25)}{2}
\] = $1,978.60
(Your solution might be slightly different based on rounding.)
Diff: 3
Terms: economic order quantity (EOQ), ordering costs, carrying costs
Objective: 3
AACSB: Analytical skills

9) The reorder point is simplest to compute when:
A) both demand and purchase-order lead times are known with certainty
B) the number of units sold varies
C) the safety stock amount never varies
D) the relevant ordering costs and the relevant carrying costs are equal
Answer: A
Diff: 2
Terms: economic order quantity (EOQ), reorder point
Objective: 3
AACSB: Reflective thinking

10) What are the major relevant costs in maintaining safety stock?
A) carrying costs and purchasing costs
B) ordering costs and purchasing costs
C) ordering costs and stockout costs
D) stockout costs and carrying costs
Answer: D
Diff: 2
Terms: safety stock
Objective: 3
AACSB: Reflective thinking
11) The annual relevant carrying costs of inventory consists of the sum of the:
A) ordering costs and carrying costs
B) stockout costs and carrying costs
C) incremental costs plus the opportunity costs of capital
D) incremental costs plus the carrying costs
Answer: C
Diff: 2
Terms: carrying costs
Objective: 3
AACSB: Reflective thinking

12) Party Animals sells stuffed tigers. Products, Inc., manufactures many different stuffed animals. Party Animals orders 10,400 tigers per year, 200 per week, at $10 per tiger. The manufacturer covers all shipping costs. Party Animals earns 12% on its cash investments. The purchase-order lead time is 3 weeks. Party Animals sells 210 tigers per week. The following data are available (based on management's estimates):

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated ordering costs per purchase order</td>
<td>$10</td>
</tr>
<tr>
<td>Estimated insurance, materials handling, breakage, and so on, per year</td>
<td>$3</td>
</tr>
<tr>
<td>Actual ordering costs per order</td>
<td>$15</td>
</tr>
</tbody>
</table>

What is the economic order quantity using the estimated amounts?
A) 119 stuffed tigers
B) 223 stuffed tigers
C) 273 stuffed tigers
D) 325 stuffed tigers
Answer: B
Explanation: B) EOQ = \[\sqrt{\frac{2 \times 10,400 \times 10}{3 + (0.12 \times 10)}}\]
EOQ = 223 units
Diff: 3
Terms: economic order quantity (EOQ)
Objective: 3
AACSB: Analytical skills

13) A conflict between the EOQ model's optimal order quantity and the order quantity the purchasing manager, evaluated on conventional accounting numbers, regards as optimal is considered a(n):
A) problem for the chief financial officer to resolve
B) problem for the performance evaluation system to resolve
C) goal congruence
D) opportunity cost
Answer: B
Diff: 2
Terms: economic order quantity (EOQ)
Objective: 3
AACSB: Analytical skills
14) Just-in-time purchasing requires:
A) larger and less frequent purchase orders
B) smaller and less frequent purchase orders
C) smaller and more frequent purchase orders
D) larger and more frequent purchase orders
Answer: C
Diff: 2
Terms: just-in-time (JIT) purchasing
Objective: 3
AACSB: Analytical skills

15) Increases in the carrying cost and decreases in the ordering cost per purchase order result in:
A) smaller EOQ amounts
B) larger EOQ amounts
C) larger relevant total costs
D) smaller relevant total costs
Answer: A
Diff: 2
Terms: economic order quantity (EOQ), ordering costs, carrying costs
Objective: 3
AACSB: Analytical skills

16) The annual relevant carrying costs of inventory consist of incremental costs plus the opportunity cost of capital.
Answer: TRUE
Diff: 3
Terms: carrying costs
Objective: 3
AACSB: Analytical skills

17) Relevant opportunity cost of capital is the return forgone by investing capital in inventory rather than elsewhere.
Answer: TRUE
Diff: 2
Terms: relevant opportunity cost of capital
Objective: 3
AACSB: Analytical skills

18) Video Boy has one particular product that has an annual demand of 2,000 units. Total manufacturing costs per unit total $20. Ordering costs for the product total $25 per purchase order. Currently, the carrying costs per unit are 25% of manufacturing costs.

**Required:**
Determine the economic manufacturing order quantity.
Answer: The square root of \( [(2 \times 2,000 \times $25) / $5] = 141.42 \) units
Diff: 2
Terms: economic order quantity (EOQ), ordering costs, carrying costs
Objective: 3
AACSB: Analytical skills
19) The IBP Grocery orders most of its items in lot sizes of 10 units. Average annual demand per side of beef is 720 units per year. Ordering costs are $25 per order with an average purchasing price of $100. Annual inventory carrying costs are estimated to be 40% of the unit cost.

**Required:**

a. Determine the economic order quantity.

b. Determine the annual cost savings if the shop changes from an order size of 10 units to the economic order quantity.

c. Since the shelf life is limited, the IBP Grocery must keep the inventory moving. Assuming a 360-day year, determine the optimal lot size under each of the following: (1) a 20-day shelf life and (2) a 10-day shelf life.

**Answer:**

a. The square root of \([2 \times 720 \times $25] / $40\) = 30 units

b. 

<table>
<thead>
<tr>
<th></th>
<th>Current 10-unit order:</th>
<th>EOQ 30-unit order:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ordering costs ($25 \times 720/10)</td>
<td>$1,800</td>
<td>$600</td>
</tr>
<tr>
<td>Carrying costs ($100 \times 0.40 \times 10/2)</td>
<td>200</td>
<td>600</td>
</tr>
<tr>
<td>Annual savings</td>
<td>$2,000</td>
<td>$1,200</td>
</tr>
<tr>
<td></td>
<td></td>
<td>$800</td>
</tr>
</tbody>
</table>

c. Average daily demand = 720 / 360 = 2 per day

Average days' supply in EOQ = 30/2 = 15 days

(1) 20-day shelf life allows for up to 40 units (20 \times 2), EOQ is acceptable.

(2) 10-day shelf life allows for up to 20 units (10 \times 2), EOQ is not acceptable

**Diff: 3**

Terms: economic order quantity (EOQ)

Objective: 3

AACSB: Analytical skills
20) The executive vice president of Robotics, Inc., is concerned because the cost of materials has not been in line with the budget for several periods, even after implementing an EOQ model. The company has the normal direct material variance computations of price and efficiency at the end of each month. The price variance of the direct materials used is usually near expectations. The vice president does not understand how the budget differences are always larger than the material price variances.

**Required:**
What explanation can you give for the evaluation problems presented?

**Answer:** An EOQ model does not solve all inventory related problems. The first problem is the timing of material price variance computations. They should be at the time of purchase, not at the time of usage. By changing when the variance is computed, the responsibility is placed where it should be, in purchasing, not in production. Also, the timing of when materials are used could explain the difference between the budget variances and the material price variances. Materials may be purchased in one period and not used until another period. Also, material usage may include items purchased during several previous periods.

**Diff:** 2

**Terms:** inventory management, economic order quantity (EOQ)

**Objective:** 3

**AACSB:** Reflective thinking

Objective 20.4

1) Flashdrive Company sells 200 flash drives per week. Purchase-order lead time is 1-1/2 weeks and the economic-order quantity is 450 units. What is the reorder point?

A) 200 units  
B) 300 units  
C) 750 units  
D) 1,125 units

**Answer:** B

**Explanation:** B) \(200 \times 1.5 = 300\) units

**Diff:** 2

**Terms:** economic order quantity (EOQ), reorder point

**Objective:** 4

**AACSB:** Analytical skills

2) Wilson's Deli can predict with virtual certainty the demand for its products. Wilson's sells 30 hams per week. Purchase-order lead time is 3 weeks and the economic-order quantity is 75 hams. What is the reorder point?

A) 30 hams  
B) 75 hams  
C) 90 hams  
D) 100 hams

**Answer:** C

**Explanation:** C) \(30 \times 3 = 90\) hams

**Diff:** 2

**Terms:** economic order quantity (EOQ), reorder point

**Objective:** 4

**AACSB:** Analytical skills
Answer the following questions using the information below:

Owen-King Company sells optical equipment. Lens Company manufactures special glass lenses. Owen-King Company orders 5,200 lenses per year, 100 per week, at $20 per lens. Lens Company covers all shipping costs. Owen-King Company earns 30% on its cash investments. The purchase-order lead time is 2.5 weeks. Owen-King Company sells 125 lenses per week. The following data are available:

- Relevant ordering costs per purchase order: $21.25
- Relevant insurance, materials handling, breakage, and so on, per year: $2.50

3) What is the economic order quantity for Owen-King Company?
A) 325 lenses  
B) 297 lenses  
C) 210 lenses  
D) 161 lenses  
Answer: D  
Explanation: D) EOQ = \( \sqrt{\frac{2 \times 5,200 \times 21.25}{(20 \times 30\%) + 2.50}} \)  
EOQ = 161 lenses  
Diff: 2  
Terms: economic order quantity (EOQ)  
Objective: 4  
AACSB: Analytical skills

4) What is the reorder point?
A) 220.5 lenses  
B) 312.5 lenses  
C) 397.5 lenses  
D) 415.5 lenses  
Answer: B  
Explanation: B) 125 lenses \( \times 2.5 \) weeks = 312.5 lenses  
Diff: 2  
Terms: reorder point  
Objective: 4  
AACSB: Analytical skills

5) The ________ describes the flow of goods, services, and information from the initial sources of materials and services to the delivery of products to consumers.
A) customer list  
B) enterprise requirements plan (ERP)  
C) material requirements plan (MRP)  
D) supply chain  
Answer: D  
Diff: 2  
Terms: supply chain  
Objective: 4  
AACSB: Reflective thinking
6) When using a vendor-managed inventory system to enhance the features of supply chain management, a challenging issue is:
   A) problems of communication and trust
   B) the sharing of accurate, timely, and relevant information about sales forecasts
   C) potentially incompatible information systems
   D) all of the above
   Answer: D
   Diff: 2
   Terms: supply chain
   Objective: 4
   AACSB: Reflective thinking

7) Just-in-time purchasing is guided solely by the economic order quantity.
   Answer: FALSE
   Explanation: Inventory management also includes purchasing costs, stockout costs, and quality costs.
   Diff: 2
   Terms: just-in-time (JIT) purchasing, economic order quantity (EOQ)
   Objective: 4
   AACSB: Analytical skills

8) Companies that implement JIT purchasing will switch their suppliers when another supplier offers a lower price.
   Answer: FALSE
   Explanation: Companies that implement JIT purchasing choose their suppliers carefully and develop long-term supplier relationships.
   Diff: 3
   Terms: just-in-time (JIT) purchasing
   Objective: 4
   AACSB: Reflective thinking

9) Just-in-time purchasing describes the flow of goods, services, and information from the initial sources of materials and services to the delivery of products to consumers, regardless of whether those activities occur in the same organization or in other organizations.
   Answer: FALSE
   Explanation: Supply chain describes the flow of goods, services, and information from the initial sources of materials and services to the delivery of products to consumers, regardless of whether those activities occur in the same organization or in other organizations.
   Diff: 3
   Terms: supply chain
   Objective: 4
   AACSB: Reflective thinking
10) The manufacturing manager of New Technology Company is concerned about the company's newest plant. When the plant began operations three years ago, it had the best of everything. It had modern equipment, well-trained employees, engineered work and assembly stations, and a controlled environment. During the first two years, the evaluation results were very good with almost all cost variances being favorable. However, recently, things have turned negative.

In recent months, everything seems to be operating in a crisis management mode. Although most cost variances remain favorable, the plant's segment contribution is declining and customers are complaining about poor quality and slow delivery. Several customers have suggested that they may take their business elsewhere if things do not improve.

The shop floor is in continual turmoil. In-process inventory is everywhere, production employees have difficulty finding jobs that need to be worked on, and scheduling has requested a larger computer to keep track of work in process.

The vice president of sales does not know where to begin with solving the customers' problems. It seems that everyone is working very hard and the plant has the best facilities and trained employees in the industry.

**Required:**
What is the nature of the plant's problems? What recommendation would you make to help improve the situation?

**Answer:** The basic problem appears to be too much work-in-process inventory and a lack of control over the flow of this inventory. Since the plant had two good years of production, it may be that increased demands are pushing the plant near its capacity and management has lost control of how to manage a near-capacity situation. Although the employees are well trained and skilled in what they do, that is not enough to ensure the production process runs smoothly. All activities must be organized to be efficient.

A beginning recommendation is to implement a materials required planning system where each workstation controls what it produces, and pushes it to the next workstation. This can be accomplished by tighter controls over the scheduling of production units by workstation. This would be incorporated with a master production schedule, bill of materials, and timely inventory system.

**Diff:** 2
**Terms:** inventory management, material requirements planning (MRP)
**Objective:** 4
**AACSB:** Communication
11) What is a supply chain, and what are the benefits of a supply chain analysis? Provide an example of these benefits.
Answer: The supply chain describes the flow of goods, services, and information from the initial sources of materials and services to the delivery of products to customers, regardless of whether these activities occur in the same organization or in other organizations. Utilizing supply chain analysis allows companies to coordinate their activities and reduce inventories throughout the supply chain. An example of the benefits of supply chain analysis might be the emergence of supplier or vendor-managed inventories such as the relationship between Procter & Gamble and Walmart.
Diff: 2
Terms: inventory management
Objective: 4
AACSB: Reflective thinking

Objective 20.5

1) A push-through system that manufactures finished goods for inventory on the basis of demand forecasts is referred to as:
A) just-in-time purchasing  
B) materials requirements planning  
C) relevant total costs  
D) economic order quantity  
Answer: B
Diff: 1
Terms: material requirements planning (MRP)
Objective: 5
AACSB: Reflective thinking

2) A demand-pull system in which each component in a production line is produced immediately as needed by the next step in the production line is referred to as:
A) just-in-time purchasing  
B) materials requirements planning  
C) relevant total costs  
D) economic order quantity  
Answer: A
Diff: 1
Terms: just-in-time (JIT) purchasing
Objective: 5
AACSB: Reflective thinking

3) The management accountant aids in MRP by:
A) doing journal entries as requested  
B) preparing plant appropriation requests  
C) maintaining accurate records of inventory and its costs  
D) contacting vendors to make sure they can deliver the materials in time  
Answer: C
Diff: 1
Terms: material requirements planning (MRP)
Objective: 5
AACSB: Reflective thinking
4) A "push-through" system, often described as a just-in-time system, emphasizes simplicity and close coordination among work centers.
Answer: FALSE
Explanation: The narrative describes a Materials Requirement Planning system.
Diff: 2
Terms: just-in-time (JIT) production
Objective: 5
AACSB: Communication

5) Costs of setting up a production run are analogous to ordering costs in the Economic Order Quantity (EOQ) model.
Answer: TRUE
Diff: 2
Terms: ordering costs
Objective: 5
AACSB: Analytical skills

6) A "demand-pull" system, often described as a materials requirement planning system, focuses first on the forecasted amount and timing of finished goods and then determines the demand for materials components and subassemblies at each of the prior stages of production.
Answer: FALSE
Explanation: The narrative describes a push-through system.
Diff: 2
Terms: material requirements planning (MRP)
Objective: 5
AACSB: Reflective thinking

7) Just-in-time (JIT) production, is a "demand-pull" manufacturing system that manufactures each component in a production line as soon as, and only when, needed by the next step in the production line.
Answer: TRUE
Diff: 2
Terms: just-in-time (JIT) production
Objective: 5
AACSB: Reflective thinking

8) Just-in-time systems are similar to materials requirement planning systems in that both systems are demand-pull systems.
Answer: FALSE
Explanation: Just-in-time systems are not similar to materials requirement planning systems in that just-in-time production is a demand-pull system and materials requirements planning is a push-through approach.
Diff: 2
Terms: just-in-time (JIT) production, materials requirements planning (MRP)
Objective: 5
AACSB: Analytical skills
9) Kretzinger Company makes extensive use of financial performance reports for each of its departments. Although most departments have been reporting favorable cost variances with the company's current inventory system, management is concerned about the overall performance of the purchasing department. For example, the following information is for the purchasing of materials for a product the company has been manufacturing for several years:

<table>
<thead>
<tr>
<th>Purchase Year</th>
<th>Quantity Used</th>
<th>Average Inventory</th>
<th>Price Variance</th>
</tr>
</thead>
<tbody>
<tr>
<td>20X1</td>
<td>40,000</td>
<td>8,000</td>
<td>$1,000 F</td>
</tr>
<tr>
<td>20X2</td>
<td>60,000</td>
<td>15,000</td>
<td>10,000 F</td>
</tr>
<tr>
<td>20X3</td>
<td>60,000</td>
<td>20,000</td>
<td>12,000 F</td>
</tr>
<tr>
<td>20X4</td>
<td>50,000</td>
<td>12,500</td>
<td>20,000 U</td>
</tr>
<tr>
<td>20X5</td>
<td>54,000</td>
<td>18,000</td>
<td>8,000 F</td>
</tr>
<tr>
<td>20X6</td>
<td>58,000</td>
<td>23,200</td>
<td>9,500 F</td>
</tr>
</tbody>
</table>

Required:

a. Compute the inventory turnover for each year. Can any conclusions be drawn for a yearly comparison of the purchase price variance and the inventory turnover?
b. Identify problems likely to be caused by evaluating purchasing only on the basis of the purchase price variance.
c. What recommendations will improve the evaluation process?

Answer:

<table>
<thead>
<tr>
<th>Year</th>
<th>Quantity used</th>
<th>Average inventory</th>
<th>Turnover</th>
</tr>
</thead>
<tbody>
<tr>
<td>20X1</td>
<td>40,000</td>
<td>8,000</td>
<td>5.0</td>
</tr>
<tr>
<td>20X2</td>
<td>60,000</td>
<td>15,000</td>
<td>4.0</td>
</tr>
<tr>
<td>20X3</td>
<td>60,000</td>
<td>20,000</td>
<td>3.0</td>
</tr>
<tr>
<td>20X4</td>
<td>50,000</td>
<td>12,500</td>
<td>4.0</td>
</tr>
<tr>
<td>20X5</td>
<td>54,000</td>
<td>18,000</td>
<td>3.0</td>
</tr>
<tr>
<td>20X6</td>
<td>58,000</td>
<td>23,200</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Favorable purchase prices appear to be associated with decreases in inventory turnover and increases in average inventory levels. Decreases in inventory turnover are a possible signal of the buildup of excess inventory. Excess inventory will reduce return on investment of the company and the above information indicates a need for a just-in-time inventory system.

b. To achieve quantity discounts and favorable materials price variances, purchasing may be ordering excess inventory, thereby increasing subsequent storage, obsolescence, and handling costs. To obtain a low price, purchasing may be ordering from a supplier whose goods have inferior quality which may, in turn, lead to increased inspection, rework, and, perhaps, dissatisfied customers.

c. It appears that two items may help improve the situation. First, consider the change to a just-in-time inventory system that would greatly improve the inventory turnover and reduce the amount of inventory carried. Second, additional measures should be used in the evaluation of the purchasing department. Either different financial measures should be used or the addition of nonfinancial measures should be implemented.
10) Minnesota Ore Company mines iron ore for production into various metal products. During recent years, the company has had large fluctuations in its inventories of metal ingots. Much of the volatility of the inventory levels is due to the variability of demand by the company's largest customers, automobile manufacturers. For large orders, the company has the technology to quickly shift production from one product to another.

**Required:**

Explain how the company can improve its inventory control system and give the advantages of whatever you recommend.

**Answer:** The company can probably benefit from changing to a just-in-time system for inventory control. This would allow the company to be responsive to actual needs rather than finished goods inventory building. The advantages would be:

1. Lower inventory requirements;
2. Reductions in carrying and handling costs of inventories;
3. Reduction in risks of obsolete inventories;
4. Reduction in total manufacturing costs; and
5. Reductions in paperwork.

**Objective 20.6**

1) A grouping of all the different types of equipment used to make a given product is referred to as:

A) total quality management  
B) materials requirements planning  
C) manufacturing cells  
D) economic order quantity

**Answer:** C

**Diff: 1**

Terms: manufacturing cells

**Objective 6**

2) The time required to get equipment, tools, and materials ready to start production is referred to as:

A) setup time  
B) manufacturing lead time  
C) pass-through time  
D) None of these answers is correct.

**Answer:** A

**Diff: 1**

Terms: lean production

**Objective 6**

**AACSB: Reflective thinking**
3) The time from when an order is received by manufacturing until it becomes a finished good is referred to as:
A) work-in-process time
B) manufacturing lead time
C) pass-through time
D) None of these answers is correct.
Answer: B
Diff: 1
Terms: lean production
Objective: 6
AACSB: Reflective thinking

4) All of the following are potential financial benefits of just-in-time EXCEPT:
A) lower investments in inventories
B) lower investments in plant space for inventories
C) reducing the risk of obsolescence
D) reducing manufacturing lead time
Answer: C
Diff: 1
Terms: just-in-time (JIT) production
Objective: 6
AACSB: Analytical skills

5) A system that comprises a single database that collects data and feeds it into software applications supporting all of a company's business activities is known as a(n):
A) economic order quantity (EOQ) system
B) enterprise requirements planning (ERP) system
C) just-in-time (JIT) system
D) material requirements planning (MRP) system
Answer: B
Diff: 2
Terms: enterprise resource planning (ERP) system
Objective: 6
AACSB: Use of Information Technology

6) One DISADVANTAGE of an enterprise resource planning (ERP) system is:
A) the use of standard costing systems is not allowed
B) these systems are not in accordance with Generally Accepted Accounting Principles (GAAP)
C) the systems must often be customized to fit the strategic needs of the user
D) the systems increase lead times when purchasing material from a supplier
Answer: C
Diff: 2
Terms: enterprise resource planning (ERP) system
Objective: 6
AACSB: Reflective thinking
7) A financial benefit of a just-in-time system is that inventory carrying costs are reduced.
Answer: TRUE
Diff: 2
Terms: just-in-time (JIT) production, just-in-time (JIT) purchasing
Objective: 6
AACSB: Reflective thinking

8) In a just-in-time system, suppliers are selected primarily on the basis of their ability to provide materials and products at the lowest possible price.
Answer: FALSE
Explanation: In a just-in-time system, suppliers are selected on the basis of their ability to deliver quality materials in a timely manner.
Diff: 2
Terms: just-in-time (JIT) production, just-in-time (JIT) purchasing
Objective: 6
AACSB: Reflective thinking

9) An Enterprise Resource Planning (ERP) System comprises a single database that collects data and feeds it into software applications supporting all of a company's business activities.
Answer: TRUE
Diff: 2
Terms: enterprise resource planning (ERP) system
Objective: 6
AACSB: Use of Information Technology
10) The Jarvis Corporation produces bucket loader assemblies for the tractor industry. The product has a long term life expectancy. Jarvis has a traditional manufacturing and inventory system. Jarvis is considering the installation of a just-in-time inventory system to improve its cost structure. In doing a full study using its manufacturing engineering team as well as consulting with industry JIT experts and the main vendors and suppliers of the components Jarvis uses to manufacture the bucket loader assemblies, the following incremental cost-benefit relevant information is available for analysis:

The Jarvis cost of investment capital hurdle rate is 15%.
One time cost to rearrange the shop floor to create the manufacturing cell workstations is $275,000.
One time cost to retrain the existing workforce for the JIT required skills is $60,000.
Anticipated defect reduction is 40%. Currently there is a cost of quality defect assessment listed as $150,000 per year.
The setup time for each of the existing functions will be reduced by 67%. Currently the forecast for setup costs are $225,000 per year.
Jarvis will expect to save $200,000 per year in carrying costs as a result of having a lower inventory.
The suppliers will require a 15% premium over the current level of prices in order to position themselves to supply the material on a smaller and more frequent schedule. Currently the materials purchases are $1,500,000 per year.

**Required:**
Determine whether it is in the best interest of Jarvis Corporation to install a JIT system.

**Answer:**
1. Initial Investment = $275,000 + 60,000 = $335,000
2. Annual Savings:
   - Defect Cost Reduction = 40% of $150,000 = $60,000
   - Setup Cost Reduction = 67% of $225,000 = $150,750
   - Carrying Cost reduction = $200,000
   Total Savings = (60,000 + 150,750 + 200,000) = $410,750
3. Annual Increased Costs:
   - Vendor Premium = 15% of $1,500,000 = $225,000
4. Net Annual Savings = (410,750 - 225,000) = $185,750
5. Savings/Initial Investment = (185,750 / 335,000) = 55 %

Since the net savings is returning 55% per year on the initial investment (which is far in excess of the companies hurdle rate of 15%), the JIT project should be implemented.

**Diff:** 3
**Terms:** just-in-time (JIT) production
**Objective:** 6
**AACSB:** Analytical skills
11) What are five features of a just-in-time manufacturing system?
Answer: A just-in-time (JIT) system has many positive features. It organizes production in manufacturing cell groups which allow for all equipment used for a given product to be grouped together. This reduces material handling costs and sequences the production process. A second feature of a JIT system is that workers are trained to be multiskilled. They are trained to operate various machines as well as to do light maintenance and repairs on the machines. A third feature of JIT is that it aggressively works to eliminate defects. Because there is a tight link between the steps, defects are quickly noticed in the next step and addressed before large numbers of units become backlogged. A fourth feature of a JIT system is that it reduces setup time and manufacturing lead time. Reduced setup costs make it more practical to produce smaller batches and react faster to changes in customer demand. A fifth feature of a JIT system is the firm only uses suppliers who are capable of meeting delivery demands in a timely fashion. This also causes an increase in the quality of the goods being received by the firm.

Diff: 2
Terms: just-in-time (JIT) production
Objective: 6
AACSB: Reflective thinking

Objective 20.7

1) Traditional normal and standard costing systems use:
A) backflush costing
B) delayed costing
C) post-deduct costing
D) sequential tracking
Answer: D
Diff: 2
Terms: backflush costing
Objective: 7
AACSB: Reflective thinking

2) A costing system that omits recording some or all of the journal entries relating to the cycle from purchase of direct materials to the sale of finished goods is called:
A) dependent costing
B) synchronous costing
C) sequential costing
D) backflush costing
Answer: D
Diff: 2
Terms: backflush costing
Objective: 7
AACSB: Reflective thinking
Answer the following questions using the information below:

Games R Us manufactures various games. For March, there were no beginning inventories of direct materials and no beginning or ending work in process. Conversion costs is the only indirect manufacturing cost category currently used. Journal entries are recorded when materials are purchased and when conversion costs are allocated under backflush costing.

Conversion costs March $ 400,000
Direct materials purchased March $1,070,000
Units produced March 58,800
Units sold March 41,800

3) Which of the following journal entries properly records the purchase of direct materials?
   A) Accounts Payable Control 1,070,000
      Inventory: Raw and In-Process Control 1,070,000
   B) Inventory: Raw and In-Process Control 1,070,000
      Accounts Payable Control 1,070,000
   C) Inventory: Raw and In-Process Control 1,070,000
      Conversion Costs 1,070,000
   D) Conversion Costs 1,070,000
      Inventory: Raw and In-Process Control 1,070,000
   Answer: B
   Diff: 3
   Terms: backflush costing, trigger point
   Objective: 7
   AACSB: Analytical skills

4) Which of the journal entries properly records conversion costs?
   A) Conversion Costs 400,000
      Various Accounts 400,000
   B) Various Accounts 400,000
      Conversion Costs 400,000
   C) Conversion Costs 400,000
      Inventory: Direct Materials 400,000
   D) Inventory: Direct Materials 400,000
      Conversion Costs 400,000
   Answer: A
   Diff: 2
   Terms: backflush costing
   Objective: 7
   AACSB: Analytical skills
5) Which of the following entries properly records the cost of goods sold for the month?
A) Finished Goods 1,045,000
   Work in Process 1,045,000
B) Cost of Goods Sold 1,045,000
   Finished Goods 1,045,000
C) Finished Goods 1,045,000
   Cost of Goods Sold 1,045,000
D) Cost of Goods Sold 1,045,000
   Work in Process 1,045,000
Answer: B
Diff: 3
Terms: backflush costing
Objective: 7
AACSB: Analytical skills

Answer the following questions using the information below:

Complete Digital Products manufactures digital cameras. For October, there were no beginning inventories of direct materials and no beginning or ending work in process. Conversion costs is the only indirect manufacturing cost category currently used. Journal entries are recorded when materials are purchased and when units are sold.

- Conversion costs - October $45,200
- Direct materials purchased - October $125,200
- Units produced - October 40,000 units
- Units sold - October 37,500 units
- Selling price $10 each

6) Which of the following journal entries properly reflects the purchase of materials in a JIT environment?
A) Inventory: Raw and In-Process 125,200
   Accounts Payable Control 125,200
B) Accounts Payable Control 125,200
   Allocated Costs: Direct Materials 125,200
C) Accounts Payable Control 125,200
   Materials Inventory 125,200
D) Allocated Costs: Direct Materials 125,200
   Inventory: Raw and Material 125,200
Answer: A
Diff: 3
Terms: backflush costing
Objective: 7
AACSB: Analytical skills
7) Which of the following journal entries would be recorded when units are sold for the month?

A) Cost of Goods Sold 159,750  
   Inventory: Raw and In-Process 159,750

B) Cost of Goods Sold 159,750  
   Inventory: Raw and In-Process 117,375  
   Conversion Costs Allocated 42,375

C) Inventory: Raw and In-Process 117,375  
   Conversion Costs Allocated 42,375  
   Cost of Goods Sold 159,750

D) Cost of Goods Sold 159,750  
   Inventory: Raw and In-Process 114,750  
   Conversion Costs Allocated 45,000

Answer: B

Explanation:

B) Direct materials ($125,200/40,000) $3.13  
Conversion costs ($45,200/40,000) 1.13  
Total $4.26

37,500 × $4.26 = $159,750  
37,500 × $3.13 = $117,375  
37,500 × $1.13 = $42,375

Diff: 3
Terms: backflush costing
Objective: 7
AACSB: Analytical skills

8) Which of the following entries would occur if the only trigger point is the production of finished units?

A) Cost of Goods Sold 159,750  
   Inventory: Raw and In-Process Control 114,750  
   Conversion Costs Allocated 45,000

B) Inventory: Raw and In-Process Control 117,375  
   Conversion Costs Allocated 42,375  
   Cost of Goods Sold 159,750

C) Finished Goods 170,400  
   Accounts Payable Control 125,200  
   Conversion Costs Allocated 45,200

D) Accounts Payable Control 125,200  
   Conversion Costs Allocated 45,200  
   Finished Goods 170,400

Answer: C

Explanation: C) 40,000 × $4.26 = $170,400  
40,000 × $3.13 = $125,200  
40,000 × $1.13 = $45,200

Diff: 3
Terms: backflush costing
Objective: 7
AACSB: Analytical skills
9) Companies that would benefit from backflush costing include companies:
A) which have fast manufacturing lead times
B) whose inventories vary from period to period
C) companies that require audit trails
D) Both A and B are correct.
Answer: A
Diff: 2
Terms: backflush costing
Objective: 7
AACSB: Reflective thinking

10) The implications of JIT and backflush costing systems for activity-based costing systems include:
A) more of the costs are direct
B) overhead cost allocations are reduced
C) Neither of these answers is correct.
D) Both of these answers are correct.
Answer: D
Diff: 2
Terms: just-in-time (JIT) production, backflush costing
Objective: 7
AACSB: Reflective thinking

11) In a backflush-costing system, no record of work in process appears in the accounting records.
Answer: TRUE
Diff: 3
Terms: backflush costing
Objective: 7
AACSB: Reflective thinking

12) Backflush costing is a costing system that omits recording some or all of the journal entries relating to the stages from purchase of direct materials to the sales of finished goods.
Answer: TRUE
Diff: 2
Terms: backflush costing
Objective: 7
AACSB: Reflective thinking

13) A trigger point refers to the inventory level at which a reorder is generated.
Answer: FALSE
Explanation: A trigger point refers to the point at which a journal entry is made.
Diff: 2
Terms: trigger point
Objective: 7
AACSB: Reflective thinking
14) A firm using a backflush costing system will always use actual costs rather than standard costs.
   Answer: FALSE
   Explanation: A firm using a backflush costing system can use standard costs as well as actual costs.
   Diff: 2
   Terms: backflush costing
   Objective: 7
   AACSB: Reflective thinking

15) The "flush" in backflush refers to the fact that there are no variances in a backflush costing system using standard costs.
   Answer: FALSE
   Explanation: The "flush" in backflush refers to the fact that costs are "flushed" out of the system after the product has been produced or sold.
   Diff: 2
   Terms: backflush costing
   Objective: 7
   AACSB: Reflective thinking

16) Companies that have fast manufacturing lead times usually find that a version of backflush costing will report cost numbers similar to what a sequential costing approach would report.
   Answer: TRUE
   Diff: 3
   Terms: backflush costing
   Objective: 7
   AACSB: Analytical skills

17) Backflush costing is usually restricted to companies adopting JIT production methods.
   Answer: FALSE
   Explanation: Backflush costing is also helpful in companies that have fast manufacturing times, and that have very stable inventory.
   Diff: 3
   Terms: backflush costing, just-in-time (JIT) production
   Objective: 7
   AACSB: Reflective thinking

18) A positive aspect of backflush costing is the presence of the visible audit trail.
   Answer: FALSE
   Explanation: In backflush costing, the visible audit trail diminishes.
   Diff: 3
   Terms: backflush costing
   Objective: 7
   AACSB: Reflective thinking
19) Vision Enterprises manufactures converter boxes for high definition TVs. All processing is initiated when an order is received. For March there were no beginning inventories. Conversion Costs and Direct Materials are the only manufacturing cost accounts. Direct Materials are purchased under a just-in-time system. Backflush costing is used with a finished goods trigger point. Additional information is as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actual conversion costs</td>
<td>$435,000</td>
</tr>
<tr>
<td>Standard materials costs per unit</td>
<td>115</td>
</tr>
<tr>
<td>Standard conversion cost per unit</td>
<td>85</td>
</tr>
<tr>
<td>Units produced</td>
<td>7,900</td>
</tr>
<tr>
<td>Units sold</td>
<td>7,600</td>
</tr>
</tbody>
</table>

**Required:**
Record all journal entries for the monthly activities related to the above transactions if backflush costing is used.

**Answer:**
*To record actual conversion costs:*

<table>
<thead>
<tr>
<th>Account</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversion Costs</td>
<td>435,000</td>
</tr>
<tr>
<td>Various Accounts</td>
<td>435,000</td>
</tr>
</tbody>
</table>

*To record finished goods:*

<table>
<thead>
<tr>
<th>Account</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finished Goods (7,900 × $200)</td>
<td>1,580,000</td>
</tr>
<tr>
<td>Inventory - Materials and In Process</td>
<td></td>
</tr>
<tr>
<td>Control (7,900 × 115)</td>
<td>908,500</td>
</tr>
<tr>
<td>Conversion Costs Allocated (7,900 × 85)</td>
<td>671,500</td>
</tr>
</tbody>
</table>

*To record sale of 7,600 units:*

<table>
<thead>
<tr>
<th>Account</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost of Finished Goods Sold (7,600 × 200)</td>
<td>1,520,000</td>
</tr>
<tr>
<td>Finished Goods</td>
<td>1,520,000</td>
</tr>
</tbody>
</table>

Diff: 2
Terms: backflush costing
Objective: 7
AACSB: Analytical skills
20) Tornado Electronics manufactures stereos. All processing is initiated when an order is received. For April there were no beginning inventories. Conversion Costs and Direct Materials are the only manufacturing cost accounts. Direct Materials are purchased under a just-in-time system. Backflush costing is used with a finished goods trigger point. Additional information is as follows:

<table>
<thead>
<tr>
<th>Actual conversion costs</th>
<th>$232,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard materials costs per unit</td>
<td>60</td>
</tr>
<tr>
<td>Standard conversion cost per unit</td>
<td>140</td>
</tr>
<tr>
<td>Units produced</td>
<td>3,200</td>
</tr>
<tr>
<td>Units sold</td>
<td>2,800</td>
</tr>
</tbody>
</table>

**Required:**
Record all journal entries for the monthly activities related to the above transactions if backflush costing is used.

**Answer:**
*To record actual conversion costs:*

<table>
<thead>
<tr>
<th>Conversion Costs</th>
<th>232,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Various Accounts</td>
<td>232,000</td>
</tr>
</tbody>
</table>

*To record finished goods:*

<table>
<thead>
<tr>
<th>Finished Goods (3,200 × $200)</th>
<th>640,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts Payable Control (3,200 × 60)</td>
<td>192,000</td>
</tr>
<tr>
<td>Conversion Costs Allocated (3,200 × 140)</td>
<td>448,000</td>
</tr>
</tbody>
</table>

*To record sale of 2,800 units:*

<table>
<thead>
<tr>
<th>Cost of Finished Goods Sold (2,800 × 200)</th>
<th>560,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finished Goods</td>
<td>560,000</td>
</tr>
</tbody>
</table>

Diff: 2
Terms: backflush costing
Objective: 7
AACSB: Analytical skills
21) Corry Corporation manufactures filters for cars, vans, and trucks. A backflush costing system is used and standard costs for a filter are as follows:

<table>
<thead>
<tr>
<th>Direct materials</th>
<th>$2.60</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conversion costs</td>
<td>4.20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$6.80</strong></td>
</tr>
</tbody>
</table>

Filters are scheduled for production only after orders are received, and are shipped immediately upon completion. This results in product costs being charged directly to cost of goods sold. In December, 3,000 filters were produced and shipped. Materials were purchased at a cost of $8,450 and actual conversion costs of $13,650 were recorded.

**Required:**

Prepare journal entries to record December's costs for the production of the filters.

**Answer:**

<table>
<thead>
<tr>
<th>Materials Inventory</th>
<th>8,450</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accounts Payable</td>
<td>8,450</td>
</tr>
<tr>
<td>Conversion Costs</td>
<td>13,650</td>
</tr>
<tr>
<td>Various Credits</td>
<td>13,650</td>
</tr>
<tr>
<td>Cost of Goods Sold</td>
<td>22,100</td>
</tr>
<tr>
<td>Materials Inventory</td>
<td>8,450</td>
</tr>
<tr>
<td>Conversion Costs</td>
<td>13,650</td>
</tr>
</tbody>
</table>

Diff: 2
Terms: backflush costing
Objective: 7
AACSB: Analytical skills

22) Backflush costing does not strictly adhere to generally accepted accounting principles. Explain why. Also, describe the types of businesses that might use backflush costing.

**Answer:**

The principal reason why backflush costing does not strictly adhere to GAAP is that the work-in-process accounts are not recognized in the accounting records. Work in process consists of unfinished goods. Substantial business resources were dedicated to their production, and should be recognized in the accounts as an asset. This approach to costing is usually used by companies that adopt JIT production methods. While not totally devoid of inventories, such companies seek to minimize inventories thus minimizing the problems associated with no work-in-process accounts.

The type of business which would use backflush costing would be firms that use JIT production, have fast manufacturing lead times, or have very stable inventory levels from period to period. For these companies, backflush costing will report cost numbers similar to what a sequential costing approach would report.

Diff: 3
Terms: backflush costing
Objective: 7
AACSB: Reflective thinking
Objective 20.8

1) Lean accounting:
A) is much simpler than traditional product costing.
B) does not compute costs for individual products.
C) Neither of these answers is correct.
D) Both of these answers are correct.
Answer:  D
Diff: 2
Terms:  lean accounting
Objective:  8
AACSB:  Reflective thinking

2) Lean accounting is a costing method that supports creating value for the customer by costing the entire value stream, NOT individual products or departments, thereby eliminating waste in the accounting process.
Answer:  TRUE
Diff: 3
Terms:  lean accounting
Objective:  8
AACSB:  Reflective thinking

3) What are the principles of lean accounting? Are there any limitations? Discuss.
Answer:  Lean accounting is a costing method that supports creating value for the customer by costing the entire value stream, not individual products or departments, thereby eliminating waste in the accounting process. If there are multiple, related products made in a single value stream, then product costs for the individual products are not even computed.
   It is a simpler means by which to calculate values and costs consistent with the emphasis of JIT and remaining focused on the supply chain concept.
   Regarding limitations of the lean accounting: (1) it does not compute costs for individual products - this may restrict its value for certain types of decisions; (2) it excludes many of the support costs and unused capacity costs; (3) it does not account for inventories under generally accepted accounting principles.
   Proponents of lean accounting argue that by focusing on the specific value stream and allocating all other costs that do not directly contribute to the value stream, those other costs will be highlighted in a way that will cause managers to reduce those costs and/or find other alternative uses for the excess capacity that may contribute to them.
Diff: 2
Terms:  lean accounting
Objective:  8
AACSB:  Reflective thinking
Objective 21.1

1) Which of the following involves significant financial investments in projects to develop new products, expand production capacity, or remodel current production facilities?
   A) capital budgeting
   B) working capital
   C) master budgeting
   D) project-cost budgeting
   Answer: A
   Diff: 1
   Terms: capital budgeting
   Objective: 1
   AACSB: Reflective thinking

2) The accounting system that corresponds to the project dimension in capital budgeting is the:
   A) net present value method
   B) internal rate of return
   C) accrual accounting rate of return
   D) life-cycle costing
   Answer: D
   Diff: 1
   Terms: capital budgeting
   Objective: 1
   AACSB: Reflective thinking

3) Capital budgeting is the process of making long-run planning decisions for investments in projects.
   Answer: TRUE
   Diff: 2
   Terms: capital budgeting
   Objective: 1
   AACSB: Analytical skills

4) A capital budget spans only a one-year period.
   Answer: FALSE
   Explanation: A capital budget normally is for a period of time greater than one year.
   Diff: 2
   Terms: capital budgeting
   Objective: 1
   AACSB: Analytical skills
5) The identify projects stage of capital budgeting gathers information from all parts of the value chain
to evaluate alternative projects.
Answer: FALSE
Explanation: This is the definition of the obtain information stage.
Diff: 1
Terms: capital budgeting
Objective: 1
AACSB: Analytical skills

6) The obtain information stage of capital budgeting gathers information from all parts of the value
chain to evaluate alternative projects.
Answer: TRUE
Diff: 1
Terms: capital budgeting
Objective: 1
AACSB: Analytical skills

7) The make decisions by choosing among alternatives stage of the capital budgeting process consists of
determining which investment yields the greatest benefit and the least cost to the organization.
Answer: TRUE
Diff: 1
Terms: capital budgeting
Objective: 1
AACSB: Analytical skills

8) The make predictions stage of the capital budgeting process consists of forecasting all potential net
income additions that are attributable to the alternative projects.
Answer: FALSE
Explanation: The make predictions stage of the capital budgeting process consists of forecasting all
potential cash flows attributable to the alternative projects.
Diff: 1
Terms: capital budgeting
Objective: 1
AACSB: Analytical skills

9) The final activity in the capital budgeting process is to obtain funding and make the investments
identified in the make decisions by choosing among alternatives stage of the process.
Answer: FALSE
Explanation: The implement decision, evaluate performance, and learn stage requires that after the
funding is obtained and the investment is made, there is a follow-up wherein the realized cash flows are
tracked, compared against the estimates, and plans are revised if necessary.
Diff: 1
Terms: capital budgeting
Objective: 1
AACSB: Analytical skills
10) Match each one of the examples below with one of the stages of the capital budgeting decision model.

**Stages:**
1. Identify Projects
2. Obtain Information
3. Make Predictions
4. Make Decisions by Choosing Among Alternatives
5. Implement the Decision, Evaluate Performance, and Learn

<table>
<thead>
<tr>
<th>Stage</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Identify Projects</td>
<td>a. Issuing corporate stock for the funds to purchase new equipment</td>
</tr>
<tr>
<td>2. Obtain Information</td>
<td>b. Learning how to effectively operate Machine #8 only takes 15 minutes</td>
</tr>
<tr>
<td>3. Make Predictions</td>
<td>c. The need to reduce the costs to process the vegetables used in producing goulash</td>
</tr>
<tr>
<td>4. Make Decisions by Choosing Among Alternatives</td>
<td>d. Monitoring the costs to operate a new machine</td>
</tr>
<tr>
<td>5. Implement the Decision, Evaluate Performance, and Learn</td>
<td>e. Percentage of defective merchandise considered too high</td>
</tr>
<tr>
<td></td>
<td>f. Will introducing the new product substantially upgrade our image as</td>
</tr>
<tr>
<td></td>
<td>a producer of quality products?</td>
</tr>
<tr>
<td></td>
<td>g. Research indicates there are five machines on the market capable of producing our product at a competitive cost.</td>
</tr>
<tr>
<td></td>
<td>h. Use of the internal rate of return for each alternative</td>
</tr>
</tbody>
</table>

Answer:

a. 5. Implement the Decision, Evaluate Performance, and Learn
b. 2. Obtain Information
c. 1. Identify Projects
d. 5. Implement the Decision, Evaluate Performance, and Learn
e. 1. Identify Projects
f. 2. Obtain Information
g. 2. Obtain Information
h. 4. Make Decisions by Choosing Among Alternatives

Diff: 2
Terms: capital budgeting
Objective: 1
AACSB: Reflective thinking

11) Explain why a corporation's customer base is considered an intangible asset.

Answer: A corporation's customer base is considered an intangible asset because if it is handled properly, a corporation's existing customers will be a source of revenues for an indefinite time period. One could make the case that the customer base is like an annuity—a steady source of revenues and earnings. Thus it is an asset, although an intangible one.

An existing customer usually will stay with a corporation if he or she is handled properly. Usually there is minimal marginal cost in retaining a customer other than producing a satisfactory product. In contrast, attracting new customers takes time, effort, and most times substantial marketing dollars. Thus, it is much easier to retain a current customer than to obtain a new one. This is why the existing customer base is considered an asset.

Diff: 2
Terms: capital budgeting
Objective: 1
AACSB: Analytical skills
12) Explain capital budgeting and then briefly discuss each of the five stages of a capital budgeting project?
Answer: Capital budgeting is long-run planning for investment projects that usually have a life that is greater than one year.

Stage 1 of a capital budgeting project is the identify projects stage in which a firm determines which types of capital investments are necessary to accomplish organization objectives and strategies. Stage 2 is the obtain information stage in which a firm gathers information from all parts of the value chain to analyze alternative projects. Stage 3 is the make predictions stage in which the firm forecasts all potential cash flows attributable to the alternative projects. Stage 4 is the make decisions by choosing among alternatives stage in which the firm determines which investment yields the greatest benefit and the least cost to the organization. Stage 5 is the implement the decision, evaluate performance, and learn stage that is further separated into two sub stages: (1) obtain funding and make the investments selected in the stage 4 process, and (2) track the realized cash flows, compare against the forecast numbers, and revise plans if necessary.

Diff: 2
Terms: capital budgeting
Objective: 1
AACSB: Reflective thinking

13) Cast Iron Stove Company wants to buy a molding machine that can be integrated into its computerized manufacturing process. It has received three bids for the machine and related manufacturer's specifications. The bids range from $3,500,000 to $3,550,000. The estimated annual savings of the machines range from $260,000 to $270,000. The payback periods are almost identical and the net present values are all within $8,000 of each other. The president just doesn't know what to do about which vendor to choose since all of the selection criteria are so close together.

Required:
What suggestions do you have for the president?
Answer: The president needs to consider nonfinancial and qualitative factors between the three vendors. Quality of output units, manufacturing flexibility, and cycle time are all additional factors that can be considered about the machines. Other items might include worker safety, ease of learning and using, and ease of maintenance.

Diff: 2
Terms: capital budgeting
Objective: 1
AACSB: Reflective thinking
Objective 21.2

1) The stage of the capital budgeting process that distinguishes which types of capital expenditure projects are necessary to accomplish organization objectives is the:
   A) identify projects stage
   B) make predictions stage
   C) obtain information stage
   D) make decisions by choosing among alternatives stage
   Answer:  A
   Diff:  1
   Terms:  capital budgeting
   Objective:  2
   AACSB:  Reflective thinking

2) The stage of the capital budgeting process during which marketing is queried for potential revenue numbers is the:
   A) identify projects stage
   B) obtain information stage
   C) make predictions stage
   D) make decisions by choosing among alternatives stage
   Answer:  B
   Diff:  1
   Terms:  capital budgeting
   Objective:  2
   AACSB:  Reflective thinking

3) The stage of the capital budgeting process that considers the expected costs and the expected benefits of alternative capital investments is the:
   A) identify projects stage
   B) make decisions by choosing among alternatives stage
   C) obtain information stage
   D) make predictions stage
   Answer:  D
   Diff:  1
   Terms:  capital budgeting
   Objective:  2
   AACSB:  Reflective thinking

4) The stage of the capital budgeting process that chooses projects for implementation is the:
   A) make decisions by choosing among alternatives stage
   B) make predictions stage
   C) identify projects stage
   D) management-control stage
   Answer:  A
   Diff:  1
   Terms:  capital budgeting
   Objective:  2
   AACSB:  Reflective thinking
5) The stage of the capital-budgeting process in which projects get underway and performance is monitored is the:
A) implement the decision, evaluate performance, and learn stage
B) make predictions stage
C) identify projects stage
D) management-control stage
Answer: A
Diff: 1
Terms: capital budgeting
Objective: 2
AACSB: Reflective thinking

6) The two factors capital budgeting emphasizes are:
A) qualitative and nonfinancial
B) quantitative and nonfinancial
C) quantitative and financial
D) qualitative and financial
Answer: C
Diff: 1
Terms: capital budgeting
Objective: 2
AACSB: Reflective thinking

7) Which of the following are NOT included in the formal financial analysis of a capital budgeting program?
A) quality of the output
B) safety of employees
C) cash flow
D) Neither A nor B are included.
Answer: D
Diff: 2
Terms: capital budgeting
Objective: 2
AACSB: Reflective thinking

8) The stage of the capital budgeting process in which a firm obtains funding for the project is the:
A) make decisions by choosing among alternatives stage.
B) make predictions stage.
C) obtain information stage.
D) implement the decision, evaluate performance, and learn stage.
Answer: D
Diff: 1
Terms: net present value (NPV) method
Objective: 2
AACSB: Reflective thinking
9) Which capital budgeting technique(s) measure all expected future cash inflows and outflows as if they occurred at a single point in time?
A) net present value  
B) internal rate of return  
C) payback  
D) Both A and B are correct.  
Answer: D  
Diff: 2  
Terms: capital budgeting, NPV method, IRR method  
Objective: 2  
AACSB: Reflective thinking  

10) Discounted cash flow methods for capital budgeting focus on:  
A) cash inflows  
B) operating income  
C) cash outflows  
D) Both A and C are correct.  
Answer: D  
Diff: 2  
Terms: discounted cash flow (DCF) methods  
Objective: 2  
AACSB: Reflective thinking  

11) Net present value is calculated using the:  
A) internal rate of return  
B) required rate of return  
C) rate of return required by the investment bankers  
D) None of these answers is correct.  
Answer: B  
Diff: 2  
Terms: net present value (NPV) method  
Objective: 2  
AACSB: Reflective thinking  

12) All of the following are methods that aid management in analyzing the expected results of capital budgeting decisions EXCEPT:  
A) accrual accounting rate-of-return method  
B) discounted cash-flow method  
C) future-value cash-flow method  
D) payback method  
Answer: C  
Diff: 2  
Terms: capital budgeting  
Objective: 2  
AACSB: Reflective thinking
13) The capital budgeting method which calculates the expected monetary gain or loss from a project by discounting all expected future cash inflows and outflows to the present point in time using the required rate of return is the:
   A) payback method  
   B) accrual accounting rate-of-return method  
   C) sensitivity method  
   D) net present value method  
   Answer:  D  
   Diff:  2  
   Terms:  net present value (NPV) method  
   Objective:  2  
   AACSB:  Reflective thinking

14) Assume your goal in life is to retire with two million dollars. How much would you need to save at the end of each year if interest rates average 6% and you have a 20-year work life?
   A) $29,130  
   B) $54,369  
   C) $240,204  
   D) $752,952  
   Answer:  B  
   Explanation:  B) S (36.786) = $2,000,000  
   S = $54,368.51  
   Diff:  3  
   Terms:  net present value (NPV) method  
   Objective:  2  
   AACSB:  Analytical skills

15) Assume your goal in life is to retire with three million dollars. How much would you need to save at the end of each year if interest rates average 5% and you have a 25-year work life?
   A) $ 49,110  
   B) $ 55,596  
   C) $ 62,858  
   D) $67,508  
   Answer:  C  
   Explanation:  C) Look up annuity factor in the table or use function on a calculator or computer.  
   S (47.727) = $3,000,000  
   S = $62,857.50  
   Diff:  3  
   Terms:  net present value (NPV) method  
   Objective:  2  
   AACSB:  Analytical skills
16) Assume your goal in life is to retire with 2 million dollars. How much would you need to save at the end of each year if investment rates average 9% and you have a 15-year work life?

A) $51,108
B) $ 68,118
C) $ 75,706
D) $ 82,572

Answer: B

Explanation: B) Look up annuity factor in the table or use function on a calculator or computer.

\[ S (29.361) = $2,000,000 \]
\[ S = $68,117.57 \]

Terms: net present value (NPV) method
Objective: 2
AACSB: Analytical skills

17) What is the net present value of the investment, assuming the required rate of return is 10%? Would the company want to purchase the new machine?

A) $164,000; yes
B) $100,000; no
C) $(100,000); yes
D) $(164,000); no

Answer: A

Explanation:

A) Yr. 0 ($120,000 - $400,000 - $120,000) \times 1.000 = $(400,000)

Yr. 1 $100,000 \times 0.909 = 90,900

Yr. 2 $300,000 \times 0.826 = 247,800

Yr. 3 $300,000 \times 0.751 = 225,300

\[ $ 164,000 \]

Diff: 3

Terms: net present value (NPV) method
Objective: 2
AACSB: Analytical skills
18) What is the net present value of the investment, assuming the required rate of return is 24%? Would the company want to purchase the new machine?

A) $(65,600); yes
B) $(32,800); no
C) $32,800; yes
D) $65,600; no

Answer: C

Explanation:

C) Yr. 0 (\(\$120,000 - \$400,000 - \$120,000\)) \times 1.000 = \$(400,000)
   Yr. 1 \$ 100,000 \times 0.806 = 80,600
   Yr. 2 \$300,000 \times 0.650 = 195,000
   Yr. 3 \$300,000 \times 0.524 = 157,200
   \$ 32,800

Diff: 3
Terms: net present value (NPV) method, required rate of return (RRR)
Objective: 2
AACSB: Analytical skills

Answer the following questions using the information below:

Jonesville Hospital has been considering the purchase of a new x-ray machine. The existing machine is operable for five more years and will have a zero disposal price. If the machine is disposed now, it may be sold for $90,000. The new machine will cost $650,000 and an additional cash investment in working capital of $20,000 will be required. The new machine will reduce the average amount of time required to take the x-rays and will allow an additional amount of business to be done at the hospital. The investment is expected to net $60,000 in additional cash inflows during the year of acquisition and $230,000 each additional year of use. The new machine has a five-year life, and zero disposal value. These cash flows will generally occur throughout the year and are recognized at the end of each year. Income taxes are not considered in this problem. The working capital investment will not be recovered at the end of the asset's life.

19) What is the net present value of the investment, assuming the required rate of return is 12%? Would the hospital want to purchase the new machine?

A) $(97,340); no
B) $51,430 no
C) $97,340; yes
D) $166,830; yes

Answer: C

Explanation:

C) Yr. 0 (\(\$90,000 - \$650,000 - \$20,000\)) \times 1.000 = $(580,000)
   Yr. 1 \$ 60,000 \times 0.893 = 53,580
   Yr. 2 \$230,000 \times 0.797 = 183,310
   Yr. 3 \$230,000 \times 0.712 = 163,760
   Yr. 4 \$230,000 \times 0.636 = 146,280
   Yr. 5 \$230,000 \times 0.567 = 130,410
   \$ 97,340

Diff: 3
Terms: net present value (NPV) method
Objective: 2
AACSB: Analytical skills
20) What is the net present value of the investment, assuming the required rate of return is 20%? Would the hospital want to purchase the new machine?
A) $33,910; yes
B) $(33,910); no
C) $(33,910); yes
D) $50,700; yes
Answer: B
Explanation:
B) Yr. 0 ($90,000 - $650,000 - $20,000) × 1.000 = $(580,000)
Yr. 1 $ 60,000 × 0.833 = 49,980
Yr. 2 $230,000 × 0.694 = 159,620
Yr. 3 $230,000 × 0.579 = 133,170
Yr. 4 $230,000 × 0.482 = 110,860
Yr. 5 $230,000 × 0.402 = 92,460
$(33,910)

Diff: 3
Terms: net present value (NPV) method
Objective: 2
AACSB: Analytical skills

21) In using the net present value method, only projects with a zero or positive net present value are acceptable because:
A) the return from these projects equals or exceeds the cost of capital
B) a positive net present value on a particular project guarantees company profitability
C) the company will be able to pay the necessary payments on any loans secured to finance the project
D) Both A and B are correct.
Answer: A
Diff: 2
Terms: net present value (NPV) method
Objective: 2
AACSB: Reflective thinking

22) Which of the following is NOT an appropriate term for the required rate of return?
A) discount rate
B) hurdle rate
C) cost of capital
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: RRR, discount rate, hurdle rate, opportunity cost of capital
Objective: 2
AACSB: Reflective thinking
23) Which of the following results of the net present value method in capital budgeting is the LEAST acceptable?
A) $(5,000)
B) $(7,000)
C) $(15,000)
D) $0
Answer: C
Diff: 2
Terms: net present value (NPV) method
Objective: 2
AACSB: Reflective thinking

24) The definition of an annuity is:
A) similar to the definition of a life insurance policy
B) a series of equal cash flows at intervals
C) an investment product whose funds are invested in the stock market
D) Both A and B are correct.
Answer: B
Diff: 2
Terms: net present value (NPV) method
Objective: 2
AACSB: Reflective thinking

25) The net present value method focuses on:
A) cash inflows
B) accrual-accounting net income
C) cash outflows
D) Both A and C are correct.
Answer: D
Diff: 2
Terms: net present value (NPV) method
Objective: 2
AACSB: Reflective thinking

26) If the net present value for a project is zero or positive, this means that the:
A) project should be accepted
B) project should not be accepted
C) expected rate of return is below the required rate of return
D) Both A and C are correct.
Answer: A
Diff: 2
Terms: net present value (NPV) method
Objective: 2
AACSB: Reflective thinking
27) Upper Darby Park Department is considering a new capital investment. The following information is available on the investment. The cost of the machine will be $300,000. The annual cost savings if the new machine is acquired will be $80,000. The machine will have a 5-year life, at which time the terminal disposal value is expected to be $40,000. Upper Darby Park Department is assuming no tax consequences. If Upper Darby Park Department has a required rate of return of 10%, which of the following is closest to the present value of the project?

A) $3,264
B) $24,836
C) $28,120
D) $300,000

Answer: C

Explanation: C) $(80,000 \times 3.791) + (40,000 \times .621) - 300,000 = 28,120$

Diff: 3

Terms: net present value (NPV) method

Objective: 2

AACSB: Analytical skills

28) Shirt Company wants to purchase a new cutting machine for its sewing plant. The investment is expected to generate annual cash inflows of $150,000. The required rate of return is 12% and the current machine is expected to last for four years. What is the maximum dollar amount Shirt Company would be willing to spend for the machine, assuming its life is also four years? Income taxes are not considered.

A) $263,500
B) $360,300
C) $395,870
D) $455,550

Answer: D

Explanation:

D) X = $150,000 \times PV Ann 4 (12\%) = $150,000 \times 3.037$

X= $455,550$

Diff: 3

Terms: net present value (NPV) method

Objective: 2

AACSB: Analytical skills
29) The Zeron Corporation wants to purchase a new machine for its factory operations at a cost of $475,000. The investment is expected to generate $175,000 in annual cash flows for a period of four years. The required rate of return is 14%. The old machine can be sold for $25,000. The machine is expected to have zero value at the end of the four-year period. What is the net present value of the investment? Would the company want to purchase the new machine? Income taxes are not considered.

A) $59,775; yes
B) $34,775; no
C) $509,775; yes
D) $163,375; no

Answer: A

Explanation:
A) Year 0 = ($25,000 - $475,000) = $(450,000)
Year 1 = $175,000 × 0.877 = 153,475
Year 2 = $175,000 × 0.769 = 134,575
Year 3 = $175,000 × 0.675 = 118,125
Year 4 = $175,000 × 0.592 = 103,600

$59,775

Diff: 3
Terms: net present value (NPV) method
Objective: 2
AACSB: Analytical skills

30) Wet and Wild Water Company drills small commercial water wells. The company is in the process of analyzing the purchase of a new drill. Information on the proposal is provided below.

Initial investment:
Asset $320,000
Working capital $ 64,000

Operations (per year for four years):
Cash receipts $320,000
Cash expenditures $ 176,000

Disinvestment:
Salvage value of drill (existing) $ 32,000

Discount rate 20%

What is the net present value of the investment? Assume there is no recovery of working capital.

A) $(124,280)
B) $20,672
C) $84,724
D) $372,672

Answer: B

Explanation:
B) -$64,000 - $320,000 + $32,000 = $(352,000)
Yr 1 = $144,000 × 0.833 = 119,952
Yr 2 = $144,000 × 0.694 = 99,936
Yr 3 = $144,000 × 0.579 = 83,376
Yr 4 = $144,000 × 0.482 = 69,408

$ 20,672

Diff: 3
Terms: net present value (NPV) method
Objective: 2
AACSB: Analytical skills
31) The capital budgeting method that calculates the discount rate at which the present value of expected cash inflows from a project equals the present value of expected cash outflows is the:
   A) net present value method
   B) accrual accounting rate-of-return method
   C) payback method
   D) internal rate of return
   Answer: D
   Diff: 2
   Terms: internal rate-of-return (IRR) method
   Objective: 2
   AACSB: Reflective thinking

32) In capital budgeting, a project is accepted only if the internal rate of return equals or:
   A) exceeds the required rate of return
   B) is less than the required rate of return
   C) exceeds the net present value
   D) exceeds the accrual accounting rate of return
   Answer: A
   Diff: 2
   Terms: internal rate-of-return (IRR) method, required rate of return (RRR)
   Objective: 2
   AACSB: Reflective thinking

33) The Zeron Corporation recently purchased a new machine for its factory operations at a cost of $921,250. The investment is expected to generate $250,000 in annual cash flows for a period of six years. The required rate of return is 14%. The old machine has a remaining life of six years. The new machine is expected to have zero value at the end of the six-year period. The disposal value of the old machine at the time of replacement is zero. What is the internal rate of return?
   A) 15%
   B) 16%
   C) 17%
   D) 18%
   Answer: B
   Explanation:
   B) $921,250 = $250,000F
   F = 3.685
   Chart criteria for six years is 3.685 = 16%
   Diff: 3
   Terms: internal rate-of-return (IRR) method, required rate of return (RRR)
   Objective: 2
   AACSB: Analytical skills
34) Brown Corporation recently purchased a new machine for $339,013.20 with a ten-year life. The old equipment has a remaining life of ten years and no disposal value at the time of replacement. Net cash flows will be $60,000 per year. What is the internal rate of return?
   A) 12%
   B) 16%
   C) 20%
   D) 24%
   Answer: A
   Explanation:
   A) $339,013.20 = $60,000F
   F = 5.65022
   Chart criteria for 10 years is 5.65022 = 12%
   Diff: 2
   Terms: internal rate-of-return (IRR) method
   Objective: 2
   AACSB: Analytical skills

35) Soda Manufacturing Company provides vending machines for soft-drink manufacturers. The company has been investigating a new piece of machinery for its production department. The old equipment has a remaining life of three years and the new equipment has a value of $52,650 with a three-year life. The expected additional cash inflows are $25,000 per year. What is the internal rate of return?
   A) 20%
   B) 16%
   C) 10%
   D) 8%
   Answer: A
   Explanation:
   A) $52,650 = $25,000F
   F = 2.106
   Chart criteria for 3 years is 2.106 = 20%
   Diff: 2
   Terms: internal rate-of-return (IRR) method
   Objective: 2
   AACSB: Analytical skills
36) Crystal Manufacturing Company provides glassware machines for major department store retailers. The company has been investigating a new piece of machinery for its production department. The old equipment has a remaining life of five years and the new equipment has a value of $117,320 with a five-year life. The expected additional cash inflows are $35,000 per year. What is the internal rate of return?
A) 10%
B) 12%
C) 15%
D) 20%
Answer: C
Explanation:
C) $117,320 = $35,000F
F = 3.352
Chart criteria for 5 years is 3.352 = 15%
Diff: 2
Terms: internal rate-of-return (IRR) method
Objective: 2
AACSB: Analytical skills

37) Springtime Flower Company provides flowers and other nursery products for decorative purposes in medium to large sized restaurants and businesses. The company has been investigating the purchase of a new specially equipped van for deliveries. The van has a value of $62,755 with a seven-year life. The expected additional cash inflows are $13,750 per year. What is the internal rate of return?
A) 10%
B) 12%
C) 15%
D) 20%
Answer: B
Explanation:
B) $62,755 = $13,750F
F = 4.564
Chart criteria for 7 years is 4.564 = 12%
Diff: 2
Terms: internal rate-of-return (IRR) method
Objective: 2
AACSB: Analytical skills

38) An important advantage of the net present value method of capital budgeting over the internal rate-of-return method is:
A) the net present value method is expressed as a percentage
B) the net present values of individual projects can be added to determine the effects of accepting a combination of projects
C) There is no advantage.
D) Both A and B are correct.
Answer: B
Diff: 2
Terms: net present value (NPV) method, internal rate-of-return (IRR) method
Objective: 2
AACSB: Reflective thinking
39) In situations where the required rate of return is NOT constant for each year of the project, it is advantageous to use:
   A) the adjusted rate-of-return method
   B) the internal rate-of-return method
   C) the net present value method
   D) sensitivity analysis
   Answer:  C
   Diff:  2
   Terms:  required rate of return (RRR), net present value (NPV) method
   Objective:  2
   AACSB:  Reflective thinking

40) A "what-if" technique that examines how a result will change if the original predicted data are NOT achieved or if an underlying assumption changes is called:
   A) sensitivity analysis
   B) net present value analysis
   C) internal rate-of-return analysis
   D) adjusted rate-of-return analysis
   Answer:  A
   Diff:  1
   Terms:  capital budgeting, sensitivity analysis
   Objective:  2
   AACSB:  Reflective thinking

41) Investment A requires a net investment of $1,600,000. The required rate of return is 12% for the four-year annuity. What are the annual cash inflows if the net present value equals 0? (rounded)
   A) $378,966
   B) $526,836
   C) $549,696
   D) $591,466
   Answer:  B
   Explanation:
   B) $3.037 × ACI - $1,600,000 = $0
       = $526,836
   Diff:  3
   Terms:  net present value (NPV) method, internal rate-of-return (IRR) method
   Objective:  2
   AACSB:  Analytical skills

42) The minimum annual acceptable rate of return on an investment is the:
   A) accrual accounting rate of return
   B) hurdle rate
   C) internal rate of return
   D) net present value
   Answer:  B
   Diff:  2
   Terms:  hurdle rate
   Objective:  2
   AACSB:  Reflective thinking
43) Upper Darby Park Department is considering a new capital investment. The following information is available on the investment. The cost of the machine will be $432,576. The annual cost savings if the new machine is acquired will be $120,000. The machine will have a 5-year life, at which time the terminal disposal value is expected to be zero. Upper Darby Park Department is assuming no tax consequences. What is the internal rate of return for Upper Darby Park Department?
A) 10%
B) 12%
C) 14%
D) 16%
Answer: B
Explanation: B) PV Factor is $432,576 / $120,000 = 3.6048. This corresponds to a 12% IRR using the annuity table for a 5-year annuity.
Diff: 3
Terms: internal rate-of-return (IRR) method
Objective: 2
AACSB: Analytical skills

44) The Required Rate of Return (RRR) is set externally by creditors as the interest rate on long term liabilities.
Answer: FALSE
Explanation: The RRR is internally set, usually by upper management, and typically reflects the return that an organization could expect to receive elsewhere for an investment of comparable risk.
Diff: 2
Terms: required rate of return (RRR), net present value (NPV) method
Objective: 2
AACSB: Analytical skills

45) Discounted cash flow methods focus on operating income.
Answer: FALSE
Explanation: Discounted cash flow methods focus on cash inflows and cash outflows.
Diff: 2
Terms: discounted cash flow (DCF) methods
Objective: 2
AACSB: Analytical skills

46) The three common discounted cash flow methods are net present value, internal rate of return, and payback.
Answer: FALSE
Explanation: The two common discounted cash flow methods are net present value and internal rate of return. The traditional payback method is not a discounted cash flow method.
Diff: 2
Terms: discounted cash flow (DCF) methods
Objective: 2
AACSB: Reflective thinking
47) The net present value (NPV) method calculates the expected monetary gain or loss from a project by discounting all expected future cash inflows and outflows back to the present point in time using the required rate of return.
Answer: TRUE
Diff: 2
Terms: net present value (NPV) method, hurdle rate
Objective: 2
AACSB: Reflective thinking

48) Internal rate of return is a method of calculating the expected net monetary gain or loss from a project by discounting all expected future cash inflows and outflows to the present point in time.
Answer: FALSE
Explanation: The internal rate of return calculates the discount rate at which the present value of expected cash inflows from a project equals the present value of expected cash outflows.
Diff: 2
Terms: internal rate-of-return (IRR) method
Objective: 2
AACSB: Reflective thinking

49) A capital budgeting project is accepted if the required rate of return equals or exceeds the internal rate of return.
Answer: FALSE
Explanation: A capital budgeting project is accepted if the internal rate of return equals or exceeds the required internal rate of return.
Diff: 2
Terms: required rate of return (RRR), internal rate-of-return (IRR) method
Objective: 2
AACSB: Reflective thinking

50) The net present value method can be used in situations where the required rate of return varies over the life of the project.
Answer: TRUE
Diff: 2
Terms: net present value (NPV) method, required rate of return (RRR)
Objective: 2
AACSB: Reflective thinking

51) The net present value method accurately assumes that project cash flows can only be reinvested at the company's required rate of return.
Answer: TRUE
Diff: 2
Terms: net present value (NPV) method, required rate of return (RRR)
Objective: 2
AACSB: Reflective thinking
a. Using a required rate of return of 16%, determine the net present value of the investment proposal.

Answer:

<table>
<thead>
<tr>
<th>Predicted Cash Flows</th>
<th>Year(s)</th>
<th>PV Factor</th>
<th>PV of Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial investment</td>
<td>0</td>
<td>1.000</td>
<td>$(41,920)</td>
</tr>
<tr>
<td>Annual operations</td>
<td>10</td>
<td>4.833</td>
<td>48,330</td>
</tr>
<tr>
<td>Net present value</td>
<td></td>
<td></td>
<td>$ 6,410</td>
</tr>
</tbody>
</table>

b. Present value factor of an annuity of $1.00 = $41,920/$10,000 = 4.192

From the annuity table, the 4.192 factor is closest to the 10-year row at the 20% column. Therefore, the IRR is 20%.

Diff: 2

Terms: NPV method, RRR, internal rate-of-return (IRR) method
Objective: 2
AACSB: Analytical skills
53) Network Service Center is considering purchasing a new computer network for $82,000. It will require additional working capital of $13,000. Its anticipated eight-year life will generate additional client revenue of $33,000 annually with operating costs, excluding depreciation, of $15,000. At the end of eight years, it will have a salvage value of $9,500 and return $5,000 in working capital. Taxes are not considered.

**Required:**

a. If the company has a required rate of return of 14%, what is the net present value of the proposed investment?

b. What is the internal rate of return?

**Answer:**

**a.**

<table>
<thead>
<tr>
<th>Predicted Cash Flows</th>
<th>Year(s)</th>
<th>PV Factor</th>
<th>PV of Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial investment</td>
<td>$(95,000)</td>
<td>0</td>
<td>1.000 $(95,000)</td>
</tr>
<tr>
<td>Annual operations, net</td>
<td>18,000</td>
<td>1-8</td>
<td>4.639 83,502</td>
</tr>
<tr>
<td>Salvage value, work cap</td>
<td>14,500</td>
<td>8</td>
<td>0.351 5,090</td>
</tr>
<tr>
<td><strong>Net present value</strong></td>
<td></td>
<td></td>
<td><strong>$(6,408)</strong></td>
</tr>
</tbody>
</table>

**b.** Trial and error is necessary. You know it is below 14% because the answer to Part A was negative and, therefore, less than the discount rate. Therefore, let's try 12%.

<table>
<thead>
<tr>
<th>Predicted Cash Flows</th>
<th>Year(s)</th>
<th>PV Factor</th>
<th>PV of Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial investment</td>
<td>$(95,000)</td>
<td>0</td>
<td>1.000 $(95,000)</td>
</tr>
<tr>
<td>Annual operations, net</td>
<td>18,000</td>
<td>1-8</td>
<td>4.968 89,424</td>
</tr>
<tr>
<td>Salvage value, work cap</td>
<td>14,500</td>
<td>8</td>
<td>0.404 5,858</td>
</tr>
<tr>
<td><strong>Net present value</strong></td>
<td></td>
<td></td>
<td><strong>$282</strong></td>
</tr>
</tbody>
</table>

The (almost) zero net present value indicates an internal rate of return of approximately 12%.

**Diff:** 3

Terms: NPV method, RRR, internal rate-of-return (IRR) method

Objective: 2

AACSB: Analytical skills
54) EIF Manufacturing Company needs to overhaul its drill press or buy a new one. The facts have been gathered, and they are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Current Machine</th>
<th>New Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase Price, New</td>
<td>$80,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Current book value</td>
<td>30,000</td>
<td></td>
</tr>
<tr>
<td>Overhaul needed now</td>
<td>40,000</td>
<td></td>
</tr>
<tr>
<td>Annual cash operating costs</td>
<td>70,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Current salvage value</td>
<td>20,000</td>
<td></td>
</tr>
<tr>
<td>Salvage value in five years</td>
<td>5,000</td>
<td>20,000</td>
</tr>
</tbody>
</table>

**Required:**
Which alternative is the most desirable with a current required rate of return of 20%? Show computations, and assume no taxes.

**Answer:**

**Present value of keeping current system:**

<table>
<thead>
<tr>
<th></th>
<th>Year(s)</th>
<th>PV Factor</th>
<th>PV of Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overhaul</td>
<td></td>
<td>1.000</td>
<td>$(40,000)</td>
</tr>
<tr>
<td>Annual operations</td>
<td>1-5</td>
<td>2.991</td>
<td>(209,370)</td>
</tr>
<tr>
<td>Salvage value</td>
<td>5</td>
<td>0.402</td>
<td>2,010</td>
</tr>
<tr>
<td><strong>Net present value</strong></td>
<td></td>
<td></td>
<td><strong>$(247,360)</strong></td>
</tr>
</tbody>
</table>

**Present value of new system:**

<table>
<thead>
<tr>
<th></th>
<th>Year(s)</th>
<th>PV Factor</th>
<th>PV of Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td></td>
<td>1.000</td>
<td>$(100,000)</td>
</tr>
<tr>
<td>Salvage value, old</td>
<td></td>
<td>1.000</td>
<td>20,000</td>
</tr>
<tr>
<td>Annual operations</td>
<td>1-5</td>
<td>2.991</td>
<td>(119,640)</td>
</tr>
<tr>
<td>Salvage value</td>
<td>5</td>
<td>0.402</td>
<td>8,040</td>
</tr>
<tr>
<td><strong>Net present value</strong></td>
<td></td>
<td></td>
<td><strong>$(191,600)</strong></td>
</tr>
</tbody>
</table>

Buying the new equipment is the most desirable by $55,760 ($247,360 - $191,600).

Diff: 3
Terms: net present value (NPV) method
Objective: 2
AACSB: Analytical skills
55) Maremount Tire Company needs to overhaul its auto lift system or buy a new one. The facts have been gathered, and they are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Current Machine</th>
<th>New Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purchase Price, New</td>
<td>$112,500</td>
<td>$148,000</td>
</tr>
<tr>
<td>Current book value</td>
<td>33,500</td>
<td></td>
</tr>
<tr>
<td>Overhaul needed now</td>
<td>27,500</td>
<td></td>
</tr>
<tr>
<td>Annual cash operating costs</td>
<td>63,000</td>
<td>48,000</td>
</tr>
<tr>
<td>Current salvage value</td>
<td>40,000</td>
<td></td>
</tr>
<tr>
<td>Salvage value in five years</td>
<td>8,000</td>
<td>35,000</td>
</tr>
</tbody>
</table>

**Required:**
Which alternative is the most desirable with a current required rate of return of 15%? Show computations, and assume no taxes.

**Answer:**

**Present value of keeping current system:**

<table>
<thead>
<tr>
<th>Predicted Cash Flows</th>
<th>Year(s)</th>
<th>PV Factor</th>
<th>PV of Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overhaul</td>
<td>(27,500)</td>
<td>0</td>
<td>$(27,500)</td>
</tr>
<tr>
<td>Annual operations</td>
<td>(63,000)</td>
<td>1-5</td>
<td>(211,176)</td>
</tr>
<tr>
<td>Salvage value</td>
<td>8,000</td>
<td>5</td>
<td>3,976</td>
</tr>
<tr>
<td>Net present value</td>
<td></td>
<td></td>
<td>$(234,700)</td>
</tr>
</tbody>
</table>

**Present value of new system:**

<table>
<thead>
<tr>
<th>Predicted Cash Flows</th>
<th>Year(s)</th>
<th>PV Factor</th>
<th>PV of Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>$(148,000)</td>
<td>0</td>
<td>$(148,000)</td>
</tr>
<tr>
<td>Salvage value, old</td>
<td>40,000</td>
<td>0</td>
<td>40,000</td>
</tr>
<tr>
<td>Annual operations</td>
<td>(48,000)</td>
<td>1-5</td>
<td>(160,896)</td>
</tr>
<tr>
<td>Salvage value</td>
<td>35,000</td>
<td>5</td>
<td>17,395</td>
</tr>
<tr>
<td>Net present value</td>
<td></td>
<td></td>
<td>$(251,501)</td>
</tr>
</tbody>
</table>

Overhauling the existing system is the most desirable by $16,801 [$(234,700) - $(251,501)].

**Diff: 3**

**Terms:** net present value (NPV) method

**Objective:** 2

**AACSB:** Analytical skills
56) ABC Boat Company is interested in replacing a molding machine with a new improved model. The old machine has a salvage value of $10,000 now and a predicted salvage value of $4,000 in six years, if rebuilt. If the old machine is kept, it must be rebuilt in one year at a predicted cost of $20,000.

The new machine costs $80,000 and has a predicted salvage value of $12,000 at the end of six years. If purchased, the new machine will allow cash savings of $20,000 for each of the first three years, and $10,000 for each year of its remaining six-year life.

**Required:**
What is the net present value of purchasing the new machine if the company has a required rate of return of 14%?

**Answer:**

<table>
<thead>
<tr>
<th></th>
<th>Predicted Cash Flows</th>
<th>Year(s)</th>
<th>PV Factor</th>
<th>PV of Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial investment</td>
<td>$(80,000)</td>
<td>0</td>
<td>1.000</td>
<td>$(80,000)</td>
</tr>
<tr>
<td>Salvage of old</td>
<td>10,000</td>
<td>0</td>
<td>1.000</td>
<td>10,000</td>
</tr>
<tr>
<td>Annual operations</td>
<td>20,000</td>
<td>1-3</td>
<td>2.322</td>
<td>46,440</td>
</tr>
<tr>
<td>Annual operations</td>
<td>10,000</td>
<td>4-6</td>
<td>(3.889-2.322)</td>
<td>15,670</td>
</tr>
<tr>
<td>Save by not rebuilding</td>
<td>20,000</td>
<td>1</td>
<td>0.877</td>
<td>17,540</td>
</tr>
<tr>
<td>Salvage of new</td>
<td>12,000</td>
<td>6</td>
<td>0.456</td>
<td>5,472</td>
</tr>
<tr>
<td>Net present value</td>
<td></td>
<td></td>
<td></td>
<td>$15,122</td>
</tr>
</tbody>
</table>

Diff: 3  
Terms: net present value (NPV) method, required rate of return (RRR)  
Objective: 2  
AACSB: Analytical skills
Retail Outlet is looking for a new location near a shopping mall. It is considering purchasing a building rather than leasing, as it has done in the past. Three retail buildings near a new mall are available but each has its own advantages and disadvantages. The owner of the company has completed an analysis of each location that includes considerations for the time value of money. The information is as follows:

<table>
<thead>
<tr>
<th>Location</th>
<th>Location A</th>
<th>Location B</th>
<th>Location C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal rate of return</td>
<td>13%</td>
<td>17%</td>
<td>20%</td>
</tr>
<tr>
<td>Net present value</td>
<td>$25,000</td>
<td>$40,000</td>
<td>$20,000</td>
</tr>
</tbody>
</table>

The owner does not understand how the location with the highest percentage return has the lowest net present value.

**Required:**
Explain to the owner what is (are) the probable cause(s) of the comparable differences.

**Answer:** The highest probability is that location C has a much lower initial investment than the other two. Therefore, it can show a higher rate of return with fewer dollars of inflow. Unfortunately, this may cause it to have the lowest net present value since this model is presented in dollar terms. Location C could also have a shorter life which could give it a higher percentage return during its life but fewer dollars overall.

**Diff:** 2  
**Terms:** net present value (NPV) method  
**Objective:** 2  
**AACSB:** Reflective thinking

**Objective 21.3**

1) The method that measures the time it will take to recoup, in the form of future cash inflows, the total dollars invested in a project is called:
   A) the accrued accounting rate-of-return method  
   B) payback method  
   C) internal rate-of-return method  
   D) the book-value method

**Answer:** B  
**Diff:** 1  
**Terms:** payback  
**Objective:** 3  
**AACSB:** Reflective thinking
2) The net initial investment for a piece of construction equipment is $2,000,000. Annual cash inflows are expected to increase by $400,000 per year. The equipment has an 8-year useful life. What is the payback period?
A) 8 years
B) 7 years
C) 6 years
D) 5 years
Answer: D
Explanation: D) $2,000,000/$400,000 = 5.0 years
Diff: 2
Terms: payback
Objective: 3
AACSB: Analytical skills

3) The payback method of capital budgeting approach to the investment decision highlights:
A) cash flow over the life of the investment
B) the liquidity of the investment
C) the tax savings of the depreciation amounts
D) having as lengthy payback time as possible
Answer: B
Diff: 2
Terms: payback
Objective: 3
AACSB: Reflective thinking

4) Upper Darby Park Department is considering a new capital investment. The following information is available on the investment. The cost of the machine will be $72,096. The annual cost savings if the new machine is acquired will be $20,000. The machine will have a 5-year life, at which time the terminal disposal value is expected to be zero. Upper Darby Park is assuming no tax consequences. Upper Darby Park has a 10% required rate of return. What is the payback period on this investment?
A) 3 years
B) 3.6 years
C) 4.2 years
D) 5 years
Answer: B
Diff: 2
Terms: payback
Objective: 3
AACSB: Analytical skills
5) Crystal Manufacturing Company provides glassware machines for major department store retailers. The company has been investigating a new piece of machinery for its production department. The old equipment has a remaining life of five years and the new equipment has a value of $231,000 with a five-year life. The expected additional cash inflows are $70,000 per year. What is the payback period on this investment?
A) 2.5 years
B) 3 years
C) 3.3 years
D) 5 years
Answer: C
Explanation: C) $231,000/$70,000 = 3.3 years.
Diff: 2
Terms: payback
Objective: 3
AACSB: Analytical skills

6) Springtime Flower Company provides flowers and other nursery products for decorative purposes in medium to large sized restaurants and businesses. The company has been investigating the purchase of a new specially equipped van for deliveries. The van has a value of $123,750 with a seven-year life. The expected additional cash inflows are $27,500 per year. What is the payback period on this investment?
A) 3 years
B) 4.5 years
C) 6 years
D) NA - project not feasible
Answer: B
Explanation: B) $123,750/$27,500 = 4.5 years.
Diff: 2
Terms: payback
Objective: 3
AACSB: Analytical skills

7) Unlike the net present value method and the internal rate-of-return method, the payback method does NOT distinguish between the origins of the cash flows.
Answer: FALSE
Explanation: None of the three capital budgeting methods distinguish between the origins of the cash flows.
Diff: 2
Terms: NPV method, internal rate-of-return (IRR) method, payback
Objective: 3
AACSB: Reflective thinking

8) The payback method is only useful when the expected cash flows in the later years of the project are highly uncertain.
Answer: FALSE
Explanation: The payback method is only useful when the expected cash flows in the later years are highly certain.
Diff: 3
Terms: payback
Objective: 3
AACSB: Analytical skills
9) A weaknesses of the payback method is that it does not consider a project's cash flows after the payback period.
Answer: TRUE
Diff: 2
Terms: payback
Objective: 3
AACSB: Analytical skills

10) Supply the missing data for each of the following proposals:

<table>
<thead>
<tr>
<th></th>
<th>Proposal A</th>
<th>Proposal B</th>
<th>Proposal C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial investment</td>
<td>(a)</td>
<td>$62,900</td>
<td>$226,000</td>
</tr>
<tr>
<td>Annual net cash inflow</td>
<td>$60,000</td>
<td>(c)</td>
<td>(e)</td>
</tr>
<tr>
<td>Life, in years</td>
<td>10</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>Salvage value</td>
<td>$0</td>
<td>$10,000</td>
<td>$0</td>
</tr>
<tr>
<td>Payback period in years</td>
<td>(b)</td>
<td>(d)</td>
<td>5.65</td>
</tr>
<tr>
<td>Internal rate of return</td>
<td>12%</td>
<td>24%</td>
<td>(f)</td>
</tr>
</tbody>
</table>

Answer:

a. Annual cash inflow

\[
\text{Present value factor for 10 years } \times 5.650
\]

Initial investment

\[
\text{Initial investment } = \frac{339,000}{60,000} = 5.65 \text{ years}
\]

b. Payback period = $339,000/$60,000 = 5.65 years

c. Initial investment

\[
\text{PV of salvage value } (10,000 \times 0.275) = (2,750)
\]

Net PV of annual net cash inflow

\[
\text{Annual cash inflow } = 60,150/3.020 = 19,917.22
\]

d. Payback = $62,900/$19,917.22 = 3.158

e. Annual net cash inflow = $226,000/5.650 = $40,000

f. PV factor for 10 years = $226,000/$40,000 = 5.650

Look up value 5.650 in PV of annuity table under 10 years and the internal rate of return is 12%.
Diff: 3
Terms: payback, internal rate-of-return (IRR) method
Objective: 2, 3
AACSB: Analytical skills
11) Book & Bible Bookstore desires to buy a new coding machine to help control book inventories. The machine sells for $36,586 and requires working capital of $4,000. Its estimated useful life is five years and will have a salvage value of $4,000. Recovery of working capital will be $4,000 at the end of its useful life. Annual cash savings from the purchase of the machine will be $10,000.

Required:

a. Compute the net present value at a 14% required rate of return.
b. Compute the internal rate of return.
c. Determine the payback period of the investment.

Answer:

a.  

<table>
<thead>
<tr>
<th>Predicted Cash Flows</th>
<th>Year(s )</th>
<th>PV Factor</th>
<th>PV of Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>0</td>
<td>1.000</td>
<td>$(36,586)</td>
</tr>
<tr>
<td>Working capital needed</td>
<td>0</td>
<td>1.000</td>
<td>(4,000)</td>
</tr>
<tr>
<td>Annual operations</td>
<td>1-5</td>
<td>3.433</td>
<td>34,330</td>
</tr>
<tr>
<td>Working capital returned</td>
<td>5</td>
<td>0.519</td>
<td>2,076</td>
</tr>
<tr>
<td>Salvage value</td>
<td>5</td>
<td>0.519</td>
<td>2,076</td>
</tr>
<tr>
<td>Net present value</td>
<td></td>
<td></td>
<td>$(2,104)</td>
</tr>
</tbody>
</table>

b. Trial and error is required. Because net present value is negative in part a, the internal rate of return is less than 14%. Start by trying 12%.

<table>
<thead>
<tr>
<th>Predicted Cash Flows</th>
<th>Year(s )</th>
<th>PV Factor</th>
<th>PV of Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>0</td>
<td>1.000</td>
<td>$(36,586)</td>
</tr>
<tr>
<td>Working capital needed</td>
<td>0</td>
<td>1.000</td>
<td>(4,000)</td>
</tr>
<tr>
<td>Annual operations</td>
<td>1-5</td>
<td>3.605</td>
<td>36,050</td>
</tr>
<tr>
<td>Working capital returned</td>
<td>5</td>
<td>0.567</td>
<td>2,268</td>
</tr>
<tr>
<td>Salvage value</td>
<td>5</td>
<td>0.567</td>
<td>2,268</td>
</tr>
<tr>
<td>Net present value</td>
<td></td>
<td></td>
<td>$0</td>
</tr>
</tbody>
</table>

With a zero net present value, the internal rate of return is 12%.

c. Payback period = ($36,586 + $4,000)/$10,000 = 4.06 years.

Diff: 3

Terms: NPV method, required rate of return (RRR), IRR method, payback
Objective: 2, 3
AACSB: Analytical skills
12) Sam's Structures desires to buy a new crane and accessories to help move and install modular buildings. The machine sells for $75,000 and requires working capital of $10,000. Its estimated useful life is six years and it will have a salvage value of $17,560. Recovery of working capital will be $10,000 at the end of its useful life. Annual cash savings from the purchase of the machine will be $20,000.

**Required:**

a. Compute the net present value at a 12% required rate of return.

b. Compute the internal rate of return.

c. Determine the payback period of the investment.

**Answer:**

a. Predicted Cash Flows

<table>
<thead>
<tr>
<th>Year(s)</th>
<th>PV Factor</th>
<th>PV of Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>$(75,000)</td>
<td>0</td>
</tr>
<tr>
<td>Working capital needed</td>
<td>(10,000)</td>
<td>0</td>
</tr>
<tr>
<td>Annual operations</td>
<td>20,000</td>
<td>1-6</td>
</tr>
<tr>
<td>Working capital returned</td>
<td>10,000</td>
<td>6</td>
</tr>
<tr>
<td>Salvage value</td>
<td>17,560</td>
<td>6</td>
</tr>
<tr>
<td>Net present value</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b. Trial and error is required. Because net present value is negative in part a, the internal rate of return is greater than 12%. Start by trying any % above 12% and the solution is listed below:

<table>
<thead>
<tr>
<th>Year(s)</th>
<th>PV Factor</th>
<th>PV of Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>$(75,000)</td>
<td>0</td>
</tr>
<tr>
<td>Working capital needed</td>
<td>(10,000)</td>
<td>0</td>
</tr>
<tr>
<td>Annual operations</td>
<td>20,000</td>
<td>1-6</td>
</tr>
<tr>
<td>Working capital returned</td>
<td>10,000</td>
<td>6</td>
</tr>
<tr>
<td>Salvage value</td>
<td>17,560</td>
<td>6</td>
</tr>
<tr>
<td>Net present value</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

With a zero net present value, the internal rate of return is 16%.

c. Payback period = ($75,000 + $10,000)/$20,000 = 4.25 years.

Diff: 3
Terms: NPV method, required rate of return (RRR), IRR method, payback
Objective: 2, 3
AACSB: Analytical skills
13) Terrain Vehicle has received three proposals for its new vehicle-painting machine. Information on each proposal is as follows:

<table>
<thead>
<tr>
<th></th>
<th>Proposal X</th>
<th>Proposal Y</th>
<th>Proposal Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial investment in equipment</td>
<td>$180,000</td>
<td>$120,000</td>
<td>$190,000</td>
</tr>
<tr>
<td>Working capital needed</td>
<td>0</td>
<td>0</td>
<td>10,000</td>
</tr>
<tr>
<td>Annual cash saved by operations:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>75,000</td>
<td>50,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Year 2</td>
<td>75,000</td>
<td>48,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Year 3</td>
<td>75,000</td>
<td>44,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Year 4</td>
<td>75,000</td>
<td>8,000</td>
<td>80,000</td>
</tr>
<tr>
<td>Salvage value end of year:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>100,000</td>
<td>80,000</td>
<td>60,000</td>
</tr>
<tr>
<td>Year 2</td>
<td>80,000</td>
<td>60,000</td>
<td>50,000</td>
</tr>
<tr>
<td>Year 3</td>
<td>40,000</td>
<td>40,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Year 4</td>
<td>10,000</td>
<td>20,000</td>
<td>15,000</td>
</tr>
<tr>
<td>Working capital returned</td>
<td>0</td>
<td>0</td>
<td>10,000</td>
</tr>
</tbody>
</table>

**Required:**
Determine each proposal's payback.

**Answer:**
Proposal X payback = $180,000/$75,000 = 2.4 years

<table>
<thead>
<tr>
<th>Proposal Y</th>
<th>Cash Savings</th>
<th>Savings Accumulated</th>
<th>To Be Recovered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 0</td>
<td></td>
<td></td>
<td>$120,000</td>
</tr>
<tr>
<td>Year 1</td>
<td>$50,000</td>
<td>$50,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Year 2</td>
<td>48,000</td>
<td>98,000</td>
<td>22,000</td>
</tr>
<tr>
<td>Year 3</td>
<td>44,000</td>
<td>142,000</td>
<td>0</td>
</tr>
</tbody>
</table>

Proposal Y payback = 2 years plus $22,000/$44,000 or 2.5 years.

Proposal Z payback = ($190,000 + $10,000)/$80,000 = 2.5 years

**Diff:** 3

**Terms:** payback

**Objective:** 3

**AACSB:** Analytical skills
14) Central Trailer Supply has received three proposals for its new trailer assembly line. Information on each proposal is as follows:

<table>
<thead>
<tr>
<th>Initial investment in equipment</th>
<th>Proposal X</th>
<th>Proposal Y</th>
<th>Proposal Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>$115,000</td>
<td>$130,000</td>
<td>$145,000</td>
<td></td>
</tr>
<tr>
<td>Working capital needed</td>
<td>0</td>
<td>0</td>
<td>15,000</td>
</tr>
<tr>
<td>Annual cash saved by operations:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>55,000</td>
<td>60,000</td>
<td>60,000</td>
</tr>
<tr>
<td>Year 2</td>
<td>55,000</td>
<td>40,000</td>
<td>60,000</td>
</tr>
<tr>
<td>Year 3</td>
<td>55,000</td>
<td>40,000</td>
<td>60,000</td>
</tr>
<tr>
<td>Year 4</td>
<td>55,000</td>
<td>10,000</td>
<td>60,000</td>
</tr>
<tr>
<td>Salvage value end of year:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>30,000</td>
<td>25,000</td>
<td>45,000</td>
</tr>
<tr>
<td>Year 2</td>
<td>25,000</td>
<td>20,000</td>
<td>40,000</td>
</tr>
<tr>
<td>Year 3</td>
<td>20,000</td>
<td>15,000</td>
<td>35,000</td>
</tr>
<tr>
<td>Year 4</td>
<td>15,000</td>
<td>10,000</td>
<td>25,000</td>
</tr>
<tr>
<td>Working capital returned:</td>
<td>0</td>
<td>0</td>
<td>15,000</td>
</tr>
</tbody>
</table>

**Required:**
Determine each proposal's payback.

**Answer:**
Proposal X payback = $115,000/$55,000 = 2.09 years

<table>
<thead>
<tr>
<th>Proposal Y</th>
<th>Cash Savings</th>
<th>Savings Accumulated</th>
<th>To Be Recovered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 0</td>
<td></td>
<td></td>
<td>$130,000</td>
</tr>
<tr>
<td>Year 1</td>
<td>$60,000</td>
<td>$60,000</td>
<td>70,000</td>
</tr>
<tr>
<td>Year 2</td>
<td>40,000</td>
<td>100,000</td>
<td>30,000</td>
</tr>
<tr>
<td>Year 3</td>
<td>40,000</td>
<td>140,000</td>
<td>0</td>
</tr>
</tbody>
</table>

Proposal Y payback = 2 years plus $30,000/$40,000 or 2.75 years.

Proposal Z payback = ($145,000 + $15,000)/$60,000 = 2.67 years

**Diff:** 3
**Terms:** payback
**Objective:** 3
**AACSB:** Analytical skills
Objective 21.4

1) The approach to capital budgeting which divides an accounting measure of income by an accounting measure of investment is the:
   A) net present value
   B) internal rate of return
   C) payback method
   D) accrual accounting rate of return
   Answer: D
   Diff: 1
   Terms: accrual accounting rate of return (AARR)
   Objective: 4
   AACSB: Reflective thinking

2) For capital budgeting decisions, the use of the accrual accounting rate of return for evaluating performance is often a stumbling block to the implementation of the:
   A) net cash flow
   B) most effective goal-congruence choice
   C) discounted cash flow method for capital budgeting
   D) most effective tax strategy
   Answer: D
   Diff: 2
   Terms: accrual accounting rate of return (AARR)
   Objective: 4
   AACSB: Reflective thinking

3) The most significant manager evaluation and goal congruence issues arise because of inconsistencies between the following methods of choosing among alternatives for capital budgeting purposes:
   A) net present value method and the internal rate of return method
   B) payback method and the net present value method
   C) net present value method and the accrual accounting rate of return method
   D) payback method and the internal rate of return method
   Answer: C
   Diff: 2
   Terms: accrual accounting rate of return (AARR)
   Objective: 4
   AACSB: Reflective thinking

4) The accrual accounting rate of return method divides the average annual income of a project by a measure of the investment in it.
   Answer: TRUE
   Diff: 2
   Terms: accrual accounting rate of return (AARR)
   Objective: 4
   AACSB: Reflective thinking
5) The accrual accounting rate-of-return method is similar to the internal rate-of-return method because both methods calculate a rate-of-return percentage.
Answer: TRUE
Diff: 2
Terms: accrual accounting rate of return (AARR)
Objective: 4
AACSB: Reflective thinking

6) Managers using discounted cash flow methods to make capital budgeting decisions make the same decisions that they would make in using the accrual accounting rate-of-return methods.
Answer: FALSE
Explanation: Managers using discounted cash flow methods to make capital budgeting decisions make different decisions that they would make in using the accrual accounting rate-of-return methods.
Diff: 2
Terms: discounted cash flow (DCF) methods, accrual accounting rate of return (AARR)
Objective: 4
AACSB: Reflective thinking

7) The accrual accounting rate-of-return method has a significant weakness for use in making capital budgeting decisions because it does NOT track cash flows and it ignores the time value of money.
Answer: TRUE
Diff: 2
Terms: discounted cash flow (DCF) methods, accrual accounting rate of return (AARR)
Objective: 4
AACSB: Reflective thinking
8) Gavin and Alex, baseball consultants, are in need of a microcomputer network for their staff. They have received three proposals, with related facts as follows:

<table>
<thead>
<tr>
<th></th>
<th>Proposal A</th>
<th>Proposal B</th>
<th>Proposal C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial investment in equipment</td>
<td>$90,000</td>
<td>$90,000</td>
<td>$90,000</td>
</tr>
<tr>
<td>Annual cash increase in operations:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>80,000</td>
<td>45,000</td>
<td>90,000</td>
</tr>
<tr>
<td>Year 2</td>
<td>10,000</td>
<td>45,000</td>
<td>0</td>
</tr>
<tr>
<td>Year 3</td>
<td>45,000</td>
<td>45,000</td>
<td>0</td>
</tr>
<tr>
<td>Salvage value</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Estimated life</td>
<td>3 yrs</td>
<td>3 yrs</td>
<td>1 yr</td>
</tr>
</tbody>
</table>

The company uses straight-line depreciation for all capital assets.

Required:

a. Compute the payback period, net present value, and accrual accounting rate of return with initial investment, for each proposal. Use a required rate of return of 14%.

b. Rank each proposal 1, 2, and 3 using each method separately. Which proposal is best? Why?

Answer:

a. Payback Method

Payback for Proposal A:

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>$80,000</td>
</tr>
<tr>
<td>Year 2</td>
<td>10,000</td>
</tr>
<tr>
<td></td>
<td>$90,000</td>
</tr>
</tbody>
</table>

Payback is 2 years

Payback for Proposal B:

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>$45,000</td>
</tr>
<tr>
<td>Year 2</td>
<td>45,000</td>
</tr>
<tr>
<td></td>
<td>$90,000</td>
</tr>
</tbody>
</table>

Payback is 2 years

Payback for Proposal C:

<table>
<thead>
<tr>
<th>Year</th>
<th>Cash Flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 1</td>
<td>$90,000</td>
</tr>
</tbody>
</table>

Payback is 1 year
Net Present Value:

<table>
<thead>
<tr>
<th>Proposal A:</th>
<th>Predicted Cash Flows</th>
<th>Year(s)</th>
<th>PV Factor</th>
<th>PV of Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>$(90,000)</td>
<td>0</td>
<td>1.000</td>
<td>$(90,000)</td>
</tr>
<tr>
<td>Annual operations</td>
<td>80,000</td>
<td>1</td>
<td>0.877</td>
<td>70,160</td>
</tr>
<tr>
<td>Year 2</td>
<td>10,000</td>
<td>2</td>
<td>0.769</td>
<td>7,690</td>
</tr>
<tr>
<td>Year 3</td>
<td>45,000</td>
<td>3</td>
<td>0.675</td>
<td>30,375</td>
</tr>
<tr>
<td>Net present value</td>
<td></td>
<td></td>
<td></td>
<td>$18,225</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Proposal B:</th>
<th>Predicted Cash Flows</th>
<th>Year(s)</th>
<th>PV Factor</th>
<th>PV of Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>$(90,000)</td>
<td>0</td>
<td>1.000</td>
<td>$(90,000)</td>
</tr>
<tr>
<td>Annual operations</td>
<td>45,000</td>
<td>1</td>
<td>0.877</td>
<td>39,465</td>
</tr>
<tr>
<td>Year 2</td>
<td>45,000</td>
<td>2</td>
<td>0.769</td>
<td>34,605</td>
</tr>
<tr>
<td>Year 3</td>
<td>45,000</td>
<td>3</td>
<td>0.675</td>
<td>30,375</td>
</tr>
<tr>
<td>Net present value</td>
<td></td>
<td></td>
<td></td>
<td>$14,445</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Proposal C:</th>
<th>Predicted Cash Flows</th>
<th>Year(s)</th>
<th>PV Factor</th>
<th>PV of Cash Flows</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment</td>
<td>$(90,000)</td>
<td>0</td>
<td>1.000</td>
<td>$(90,000)</td>
</tr>
<tr>
<td>Annual operations</td>
<td>90,000</td>
<td>1</td>
<td>0.877</td>
<td>78,930</td>
</tr>
<tr>
<td>Net present value</td>
<td></td>
<td></td>
<td></td>
<td>$11,070</td>
</tr>
</tbody>
</table>

Accrual Accounting Rate of Return:

Proposal A: \( \frac{($80,000 + $10,000 + $45,000) / 3 - ($90,000 / 3)}{$90,000} = 0.167 \)

Proposal B: \( \frac{($45,000 - $30,000)}{$90,000} = 0.167 \)

Proposal C: \( \frac{($90,000 - $90,000)}{$90,000} = 0.0 \)
b. **Summary:**

<table>
<thead>
<tr>
<th>Method</th>
<th>Proposal A</th>
<th>Proposal B</th>
<th>Proposal C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payback method ranks</td>
<td>2.5</td>
<td>2.5</td>
<td>1.0</td>
</tr>
<tr>
<td>Net present value</td>
<td>1.0</td>
<td>2.0</td>
<td>3.0</td>
</tr>
<tr>
<td>AARR</td>
<td>1.5</td>
<td>1.5</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Even though Proposal C is Number 1 for payback, it comes in last with the other two methods. Because the net present value method takes into account the time value of money and the other proposals are less comprehensive, Proposal A would be the best alternative.

9) Jensen Manufacturing is considering buying an automated machine that costs $500,000. It requires working capital of $50,000. Annual cash savings are anticipated to be $206,000 for five years. The company uses straight-line depreciation. The salvage value at the end of five years is expected to be $20,000. The working capital will be recovered at the end of the machine's life.

**Required:**
Compute the accrual accounting rate of return based on the initial investment.

**Answer:**

\[
\text{Accrual accounting income} = 206,000 - \left(\frac{(500,000 - 20,000)}{5}\right)
\]

\[
= 206,000 - \text{96,000}
\]

\[
= 110,000
\]

\[
\text{AARR with initial investment} = \frac{110,000}{(500,000 + 50,000)}
\]

\[
= \frac{110,000}{550,000}
\]

\[
= 0.20
\]

**Diff:** 2
**Terms:** accrual accounting rate of return (AARR)
**Objective:** 4
**AACSB:** Analytical skills
10) What are the four alternative methods for evaluating capital budgeting projects? What is an advantage and disadvantage of each method?

Answer: The four methods are: 1. Net Present Value (NPV); 2. Internal Rate of Return (IRR); 3. Payback; and 4. Accrual Accounting Rate of Return (AARR). NPV has advantages in that it uses discounted cash flows, and can deal with uneven cash flows, considers the inflows and outflows of the project. A disadvantage of NPV is that the results indicate if it achieves a particular cost of capital or not, but it does not indicate what the rate of return actually is. The IRR method generates an expected rate of return for the investment given the time of the project and the discounting of cash flows. A disadvantage of the IRR is that the results are expressed in the form of a percentage rather than in dollars and it is difficult to use when the project has uneven cash flows. The payback is simple to use, and adapts to both even and uneven cash flows. It also highlights the liquidity of a project. A disadvantage to the payback is that it does not consider either the time value of money, or the cash flows that occur after the payback time period. The AARR method uses the information that is most often found in financial statements including net income and depreciation. A drawback is that the method does not take into account the time value of money or the cash flows of the project.

Diff: 2

Terms: capital budgeting
Objective: 2, 3, 4
AACSB: Reflective thinking
11) Bock Construction Company is considering four proposals for the construction of new loading facilities that will include the latest in ship loading/unloading equipment. After careful analysis, the company's accountant has developed the following information about the four proposals:

<table>
<thead>
<tr>
<th></th>
<th>Proposal 1</th>
<th>Proposal 2</th>
<th>Proposal 3</th>
<th>Proposal 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payback period</td>
<td>4 years</td>
<td>4.5 years</td>
<td>6 years</td>
<td>7 years</td>
</tr>
<tr>
<td>Net present value</td>
<td>$80,000</td>
<td>$178,000</td>
<td>$166,000</td>
<td>$308,000</td>
</tr>
<tr>
<td>Internal rate of return</td>
<td>12%</td>
<td>14%</td>
<td>11%</td>
<td>13%</td>
</tr>
<tr>
<td>Accrual accounting rate of return</td>
<td>8%</td>
<td>6%</td>
<td>4%</td>
<td>7%</td>
</tr>
</tbody>
</table>

**Required:**

How can this information be used in the decision-making process for the new loading facilities? Does it cause any confusion?

Answer: The managers can use the information to determine which proposal is best under the various alternatives. This may be accomplished by ranking each alternative. Also, the managers must determine the factors that are the most important to the company. For example, if short-run risk is high, a short payback period may be highly desirable. In this case, Proposal 1 is best. However, if total cash returned is critical to the company's operations, then Proposal 4 is probably best.

Any time that multiple measures are used there may be confusion because very seldom will one proposal appear to be the best with all models. In this case, payback ranks Proposal 1 the best, NPV ranks Proposal 4 the best, IRR ranks Proposal 2 the best, and AARR ranks Proposal 1 the best. The importance of each ranking will depend upon the circumstances of the organization and the managers must be attuned as to what is most favorable.

The net present value and the internal rate-of-return methods are superior because they consider the time value of money.

Diff: 2  
Terms: payback; NPV, IRR method; accrual accounting rate of return (AARR)  
Objective: 2, 3, 4  
AACSB: Analytical skills  
Objective 21.5

1) In the analysis of a capital budgeting proposal, for which of the following items are there NO after-tax consequences?  
A) cash flow from operations  
B) gain or loss on the disposal of the asset  
C) reduction of working capital balances at the end of the useful life of the capital asset  
D) None of these answers is correct.  
Answer: C  
Diff: 2  
Terms: capital budgeting  
Objective: 5  
AACSB: Reflective thinking
2) The Alpha Beta Corporation disposes a capital asset with an original cost of $170,000 and accumulated depreciation of $109,000 for $50,000. Alpha betas tax rate is 40%. Calculate the after-tax cash inflow from the disposal of the capital asset.

A) $4,400
B) ($4,400)
C) $54,400
D) $63,000

Answer: C

Explanation: C) ($170,000 - $109,000) = $61,000 - $50,000 = $11,000 loss × 0.4 = $4,400 tax savings from loss plus $50,000 proceeds = $54,400

Diff: 3
Terms: capital budgeting
Objective: 5
AACSB: Analytical skills

3) The Silver Shades Corporation disposes a capital asset with an original cost of $230,000 and accumulated depreciation of $125,000 for a salvage price of $36,000. Silver Shades's tax rate is 30%. Calculate the after-tax cash inflow from the disposal of the capital asset.

A) $2,070
B) $38,070
C) $36,000
D) $56,700

Answer: D

Explanation: D) ($230,000 - $125,000) = $105,000 - $36,000 = $69,000 loss × .3 = $20,700 tax savings from loss plus $36,000 proceeds = $56,700

Diff: 3
Terms: capital budgeting
Objective: 5
AACSB: Analytical skills

4) The phenol Corporation has an annual cash inflow from operations from its investment in a capital asset of $25,000 each year for five years. The corporation's income tax rate is 40%. Calculate the five years total after-tax cash inflow from operations.

A) $125,000
B) $150,000
C) $75,000
D) $25,000

Answer: C

Explanation: C) $25,000 × 5 = $125,000 × (1 - 0.4) = $75,000 net cash flow

Diff: 3
Terms: capital budgeting
Objective: 5
AACSB: Analytical skills
5) The Lancaster Corporation has an annual cash inflow from operations from its investment in a capital asset of $22,000 each year for five years. The corporation's income tax rate is 25%. Calculate the five years total after-tax cash inflow from operations.
A) $10,000
B) $82,500
C) $88,000
D) $110,000
Answer: B
Explanation: B) $22,000 × 5 = $110,000 × (1 - 0.25) = $82,500 net cash flow
Diff: 3
Terms: capital budgeting
Objective: 5
AACSB: Analytical skills

6) Comparison of the actual results for a project to the costs and benefits expected at the time the project was selected is referred to as:
A) the audit trail
B) management control
C) a post-investment audit
D) a cost-benefit analysis
Answer: C
Diff: 2
Terms: capital budgeting
Objective: 5
AACSB: Reflective thinking

7) A capital budgeting tool that management can use to summarize the difference in the future net cash inflows from an intangible asset at two different points in time is referred to as:
A) the accrual accounting rate-of-return method
B) the net present value method
C) sensitivity analysis
D) the payback method
Answer: B
Diff: 2
Terms: net present value (NPV) method
Objective: 5
AACSB: Reflective thinking

8) The focus in capital budgeting should be on:
A) the tax consequences of different investment strategies
B) the internal rate of return of different strategies
C) expected future cash flows that differ between alternatives
D) None of these answers is correct.
Answer: C
Diff: 2
Terms: capital budgeting
Objective: 5
AACSB: Reflective thinking
9) All of the following are major categories of cash flows in capital investment decisions EXCEPT:
A) the initial investment in machines and working capital
B) recurring operating cash flows
C) the initial working capital investment
D) depreciation expense reported on the income statement
Answer: D
Diff: 2
Terms: capital budgeting
Objective: 5
AACSB: Reflective thinking

10) An example of a sunk cost in a capital budgeting decision for new equipment is:
A) an increase in working capital required by a particular investment choice
B) the book value of the old equipment
C) the necessary transportation costs on the new equipment
D) All of these answers are correct.
Answer: B
Diff: 2
Terms: capital budgeting
Objective: 5
AACSB: Reflective thinking

11) Depreciation is usually NOT considered an operating cash flow in capital budgeting because:
A) depreciation is usually a constant amount each year over the life of the capital investment
B) deducting depreciation from operating cash flows would be counting the lump-sum amount twice
C) depreciation usually does not result in an increase in working capital
D) depreciation usually has no effect on the disposal price of the machine
Answer: B
Diff: 1
Terms: capital budgeting
Objective: 5
AACSB: Reflective thinking

12) The relevant terminal disposal price of a machine equals the:
A) difference between the salvage value of the old machine and the ultimate salvage value of the new machine
B) total of the salvage values of the old machine and the new machine
C) salvage value of the old machine
D) salvage value of the new machine
Answer: A
Diff: 3
Terms: capital budgeting
Objective: 5
AACSB: Reflective thinking
13) Post-investment audits:
A) should be done as soon as possible after the investment is made.
B) provide management with feedback about the performance of a project.
C) include obtaining appropriation requests so that the funding will be authorized to purchase the equipment.
D) are usually not feasible in a large project because the cost accounting system does not collect actual costs at the same level of detail as the initial plans had.
Answer: B
Diff: 3
Terms: capital budgeting
Objective: 5
AACSB: Communication

14) The reason to have a post-investment audits is:
A) they discourage mid-level managers from making overly optimistic estimates during the early stages of the capital budgeting process.
B) they help alert senior management to problems in the implementation of the project.
C) they are a means by which actual results can be compared to the costs and benefits expected.
D) All of the above are correct.
Answer: D
Diff: 3
Terms: capital budgeting
Objective: 5
AACSB: Communication

15) Capital investment decisions that are strategic in nature:
A) are easily handled by the capital budgeting process when the accrual accounting rate of return method is used as the tool to analyze the alternatives.
B) are often referred to as "real options."
C) require managers to consider a broad range of factors that may be difficult to estimate.
D) All of the above are correct.
Answer: C
Diff: 3
Terms: capital budgeting
Objective: 5
AACSB: Analytical skills

16) The four typical categories of cash flow for an investment project are: (1) net initial investment, (2) net income, (3) after tax cash flow from operations, and (4) after tax cash flow from terminal disposal of an asset.
Answer: FALSE
Explanation: The three typical categories of cash flow for an investment project are: (1) net initial investment, (2) after tax cash flow from operations, and (3) after tax cash flow from terminal disposal of an asset.
Diff: 2
Terms: capital budgeting
Objective: 5
AACSB: Reflective thinking
17) Depreciation tax deductions result in tax savings that partially offset the cost of acquiring the capital asset.
Answer: TRUE
Diff: 2
Terms: capital budgeting
Objective: 5
AACSB: Analytical skills

18) The use of an accelerated method of depreciation for tax purposes would usually decrease the present value of the investment.
Answer: FALSE
Explanation: The use of an accelerated method of depreciation for tax purposes would usually increase the present value of the investment.
Diff: 3
Terms: net present value (NPV) method
Objective: 5
AACSB: Analytical skills

19) An example of an intangible asset would be a corporation's customer base.
Answer: TRUE
Diff: 2
Terms: net present value (NPV) method
Objective: 5
AACSB: Reflective thinking

20) Relevant cash flows are expected future cash flows that differ among the alternative uses of investment funds.
Answer: TRUE
Diff: 2
Terms: capital budgeting
Objective: 5
AACSB: Analytical skills

21) Deducting depreciation from operating cash flows would result in counting the initial investment twice in a discounted cash flow analysis.
Answer: TRUE
Diff: 2
Terms: discounted cash flow (DCF) methods
Objective: 5
AACSB: Analytical skills

22) In determining whether to keep a machine or replace it, the original cost of the machine is a sunk cost and is NOT a relevant factor.
Answer: TRUE
Explanation: In determining whether to keep a machine or replace it, the original cost of the machine is a sunk cost and is not a relevant factor.
Diff: 2
Terms: capital budgeting
Objective: 5
AACSB: Analytical skills
23) In the net present value (NPV) method, pre-tax cash flows should be used instead of after-tax cash flows when taxes are a consideration.
Answer: FALSE
Explanation: In the net present value (NPV) method, after-tax cash flows should be used instead of pre-tax cash flows when taxes are a consideration.
Diff: 2
Terms: capital budgeting
Objective: 5
AACSB: Reflective thinking

24) In calculating the net initial investment cash flows, any increase in working capital required for the project should be included.
Answer: TRUE
Diff: 2
Terms: capital budgeting
Objective: 5
AACSB: Analytical skills

25) Cash received from the disposal of old equipment is NOT relevant to a decision to buy a replacement.
Answer: FALSE
Explanation: Cash received from the disposal of old equipment is relevant to a decision to buy a replacement.
Diff: 2
Terms: capital budgeting
Objective: 5
AACSB: Ethical reasoning

26) A increase in the tax rate will increase the net present value (NPV) for a given capital budgeting project.
Answer: FALSE
Explanation: A increase in the tax rate will decrease the net present value (NPV) for a given capital budgeting project.
Diff: 2
Terms: capital budgeting
Objective: 5
AACSB: Analytical skills

27) It is possible to use the net present value in an analysis of customer profitability.
Answer: TRUE
Diff: 2
Terms: capital budgeting
Objective: 5
AACSB: Analytical skills
28) Using capital budgeting techniques to track and (based on success to date) modify resource levels committed to staged R&D investments is called timed options.
Answer: FALSE
Explanation: Using capital budgeting techniques to track and (based on success to date) modify resource levels committed to staged R&D investments is called real options.
Diff: 2
Terms: capital budgeting
Objective: 5
AACSB: Reflective thinking

29) Explain why the term tax shield is used in conjunction with depreciation.
Answer: Depreciation tax deductions result in tax savings which offset the cost of acquiring the capital equipment. The more rapid for tax purposes an asset's costs can be written off for tax purposes, the earlier the reductions in taxes can be realized. The term tax shield refers to the reduction in the tax payments owed. Thus the faster the depreciation, the earlier the reductions in taxes and the greater the net present value of the tax shield.
Diff: 2
Terms: capital budgeting
Objective: 5
AACSB: Reflective thinking

Objective 21.6

1) A manager who uses discounted cash flow methods to make capital budgeting decisions does NOT face goal-congruence issues if the accrual accounting rate of return is used for performance evaluation.
Answer: FALSE
Explanation: The manager does face goal-congruence issues.
Diff: 2
Terms: discounted cash flow (DCF) methods, capital budgeting
Objective: 6
AACSB: Reflective thinking

2) There is an INCONSISTENCY between using the net present value method as best for capital budgeting decisions and then using a different method to evaluate performance.
Answer: TRUE
Diff: 2
Terms: discounted cash flow (DCF) methods, capital budgeting
Objective: 6
AACSB: Analytical skills
3) What conflicts can arise between using discounted cash flow methods for capital budgeting decisions and accrual accounting for performance evaluation? How can these conflicts be reduced?

Answer: Using accrual accounting to evaluate the performance of a manager may create conflicts with using discounted cash flow (DCF) methods for capital budgeting because frequently a project using a DCF method will not report strong operating income results in the early years of the project under accrual accounting. If this is the case, a manager might be tempted not to use DCF methods even though the decisions based on them might be in the best interests of the company over the long run. The conflict can be reduced by evaluating managers on a project-by-project basis and by looking at their ability to achieve the amounts and timing of forecasted cash flows.

Diff: 3
Terms: discounted cash flow (DCF) methods, accrual accounting rate of return (AARR)
Objective: 6
AACSB: Reflective thinking

Objective 21.7

1) Discuss a range of factors that managers may have to consider when making capital budgeting decisions that are strategic in nature.

Answer: The introduction of new technology into the product line offerings of a company will likely contain many elements of uncertainty. Will the customers value it? What will the price structure be? Also, when managers introduce automation into the workplace, it may be difficult to assess the impact it will have on the existing workforce. The managers must develop and insert a great deal of judgement and sometimes intuition when trying to incorporate and quantify their effects as part of the capital budgeting process.

Diff: 2
Terms: capital budgeting
Objective: 7
AACSB: Reflective thinking

Objective 21.A

1) The nominal approach to incorporating inflation into the net present value method predicts cash inflows in real monetary units and uses a real rate as the required rate of return.

Answer: FALSE
Explanation: This is the definition of the real approach.

Diff: 2
Terms: nominal rate of return, net present value (NPV) method, real rate of return
Objective: A
AACSB: Reflective thinking
2) How is inflation related to capital budgeting? Discuss.
Answer: When using the net present value method (the definitive method for evaluating alternative options in capital budgeting), it is important to understand what elements are included in the rate of return percentage. In general, it is expected that there will always be a decline in the general purchasing power of whatever monetary units are in use (dollar, etc.). The real rate of return consists of a risk free element as well as a business risk element but excludes the inflation element. The nominal rate of return includes all three components: the risk free element, business risk element, and inflation element.

It is acceptable to use either the real rate of return or the nominal rate of return when performing capital budgeting analysis using the net present value concepts. The main caveat is to understand which one is being used and to make sure that there is internal consistency within the analysis such that all cash flows (in and out) are using the same approach.

Diff: 2
Terms: capital budgeting
Objective: A
AACSB: Reflective thinking
1) Which of the following is NOT a characteristic of a management control system?
A) It aids and coordinates the process of making decisions.
B) It encourages short-term profitability.
C) It motivates individuals throughout the organization to act in concert.
D) It coordinates forecasting sales and cost-driver activities, budgeting, and measuring and evaluating performance.
Answer: B  
Diff: 2  
Terms: management control system  
Objective: 1  
AACSB: Reflective thinking

2) The formal management control system includes:
A) performance measures  
B) mutual commitments  
C) incentive plans  
D) Both A and C are correct.
Answer: D  
Diff: 1  
Terms: management control system  
Objective: 1  
AACSB: Reflective thinking

3) Exertion towards a goal is:
A) motivation  
B) effort  
C) goal congruence  
D) incentive  
Answer: B  
Diff: 1  
Terms: effort  
Objective: 1  
AACSB: Reflective thinking

4) The degree of freedom to make decisions is:
A) decentralization  
B) autonomy  
C) centralization  
D) motivation  
Answer: B  
Diff: 1  
Terms: autonomy  
Objective: 1  
AACSB: Reflective thinking
5) If an oil refinery used refinery down-time as a Balanced Scorecard control measure, it would represent the ________ perspective.
A) financial
B) customer
C) internal business process
D) learning and growth
Answer: C
Diff: 2
Terms: management control system
Objective: 1
AACSB: Reflective thinking

6) If a computer manufacturer used its common stock price as a Balanced Scorecard control measure, it would represent the ________ perspective.
A) financial
B) customer
C) internal business process
D) learning and growth
Answer: A
Diff: 2
Terms: management control system
Objective: 1
AACSB: Reflective thinking

7) The goal of a management control system is to improve the collective decisions in an organization in an economically feasible way.
Answer: TRUE
Diff: 1
Terms: management control system
Objective: 1
AACSB: Communication

8) Management control systems reflect only financial data.
Answer: FALSE
Explanation: Management control systems also reflect nonfinancial data.
Diff: 1
Terms: management control system
Objective: 1
AACSB: Reflective thinking
9) Of the four perspectives of the balanced scorecard the customer perspective refers to employee satisfaction, absenteeism, information systems capabilities, and number of processes with real-time feedback.
Answer: FALSE
Explanation: Of the four perspectives of the balanced scorecard the learning and growth perspective refers to employee satisfaction, absenteeism, information systems capabilities, and number of processes with real-time feedback.
Diff: 1
Terms: Balanced Scorecard
Objective: 1
AACSB: Reflective thinking

10) Motivation is the desire to attain a selected goal combined with the resulting drive or pursuit toward that goal.
Answer: TRUE
Diff: 1
Terms: motivation
Objective: 1
AACSB: Reflective thinking

11) The essence of decentralization is the freedom for managers at lower levels of the organization to make decisions.
Answer: TRUE
Diff: 1
Terms: decentralization
Objective: 1
AACSB: Analytical skills

12) The formal management control system includes shared values, loyalties, and mutual commitments among members of the company, company culture, and norms about acceptable behavior for managers and other employees.
Answer: FALSE
Explanation: The informal management control system includes shared values, loyalties, and mutual commitments among members of the company, company culture, and norms about acceptable behavior for managers and other employees.
Diff: 2
Terms: management control system
Objective: 1
AACSB: Analytical skills

13) A well-designed management control system obtains all of its information from within the company.
Answer: FALSE
Explanation: Well-designed management control systems use information both from within the company and from outside the company, such as stock price and customer satisfaction measures.
Diff: 2
Terms: management control system
Objective: 1
AACSB: Communication
14) Number of processes with real time feedback would be an example of a Balanced Scorecard control measure from a customer perspective.
Answer: FALSE
Explanation: Number of processes with real time feedback would be an example of a Balanced Scorecard control measure from a learning and growth perspective.
Diff: 2
Terms: management control system
Objective: 1
AACSB: Reflective thinking

15) Goal congruence exists when individuals work toward achieving one goal, and groups work toward achieving a different goal.
Answer: FALSE
Explanation: Goal congruence exists when individuals and groups work toward achieving the same goal.
Diff: 2
Terms: goal congruence
Objective: 1
AACSB: Reflective thinking

16) Effort is defined as achievement of a goal.
Answer: FALSE
Explanation: Effort is the extent to which managers strive or endeavor in order to achieve a goal.
Diff: 2
Terms: effort
Objective: 1
AACSB: Reflective thinking

17) Effort in terms of management control systems is defined in terms of physical exertion such as a worker producing at a faster rate.
Answer: FALSE
Explanation: Effort goes beyond physical exertion and includes both physical and mental actions.
Diff: 2
Terms: effort
Objective: 1
AACSB: Reflective thinking

18) Management control systems motivate managers and other employees to exert effort through a variety of rewards tied to the achievement of goals.
Answer: TRUE
Diff: 2
Terms: effort
Objective: 1
AACSB: Communication
19) For each of the following Balanced Scorecard measures, identify which of the four perspectives (Financial, Customer, Internal Business Process, or Learning and Growth) the measure best represents.

________________ a. On-time delivery of gasoline from refineries to retail stations
________________ b. Customer satisfaction
________________ c. Common stock price
________________ d. Return on investment
________________ e. Market share
________________ f. Number of days lost to accidents
________________ g. Employee satisfaction
________________ h. Friendliness of employees
________________ i. Repeat purchases
________________ j. Cash flow from operations

Answer:

a. Internal business process
b. Customer
c. Financial
d. Financial
e. Customer
f. Internal business process
g. Learning and growth
h. Internal business process
i. Customer
j. Financial

Diff: 3
Terms: transfer price
Objective: 1
AACSB: Analytical skills

20) Discuss the possible problems a corporation might have if its operations are totally decentralized.

Answer: (Answers may vary.)
Senior management has the ultimate responsibility for the business. In a totally decentralized operation, senior executive management has little say about the conduct of the business. Another problem could be caused by the appointment of managers who are not capable of running their business. The lack of senior management control might result in problems developing and resulting in even bigger problems before anyone was aware of the incompetent managers.

Certain types of activities belong centralized such as gathering information and certain human resource functions.

Diff: 2
Terms: decentralization
Objective: 1
AACSB: Reflective thinking
Objective 22.2

1) ________ means minimum constraints and maximum freedom for managers at the lowest levels of an organization to make decisions and to take actions.
A) Total centralization
B) Use of market-based transfer pricing
C) Total decentralization
D) Use of negotiated transfer pricing
Answer: C
Diff: 2
Terms: decentralization
Objective: 2
AACSB: Reflective thinking

2) An advantage of decentralization is that it:
A) creates greater responsiveness to local needs
B) focuses manager's attention on the organization as a whole
C) does not result in a duplication of activities
D) reduces the cost of gathering information
Answer: A
Diff: 1
Terms: decentralization
Objective: 2
AACSB: Reflective thinking

3) A DISADVANTAGE of decentralization is that it:
A) creates greater responsiveness to local needs
B) focuses manager's attention on the organization as a whole
C) does not result in a duplication of activities
D) encourages suboptimal decision making
Answer: D
Diff: 1
Terms: decentralization
Objective: 2
AACSB: Reflective thinking

4) All of the following are benefits of decentralization EXCEPT that it:
A) creates greater responsiveness to local needs
B) decreases management and worker morale
C) leads to quicker decision making
D) sharpens the focus of managers
Answer: B
Diff: 2
Terms: decentralization
Objective: 2
AACSB: Reflective thinking
5) What is the term used to describe the situation when a manager's decision, which benefits one subunit, is more than offset by the costs to the organization as a whole?
A) suboptimal decision making
B) dysfunctional decision making
C) congruent decision making
D) Both A and B are correct.
Answer: D
Diff: 2
Terms: suboptimal decision making, dysfunctional decision making
Objective: 2
AACSB: Ethical reasoning

6) Which of the following statements is FALSE?
A) A centralized structure does not empower employees to handle customer complaints directly.
B) A decentralized structure forces top management to lose some control over the organization.
C) Decentralization slows responsiveness to local needs for decision making.
D) The extent to which decisions are pushed downward, and the types of decisions that are pushed down, provide a measure of the level of centralization/decentralization in an organization.
Answer: C
Diff: 2
Terms: decentralization
Objective: 2
AACSB: Reflective thinking

7) Area(s) which is/are usually appropriate for decentralized decision making is(are):
A) sources of supplies and materials
B) long-term financing
C) product advertising
D) Both A and C are correct.
Answer: D
Diff: 2
Terms: decentralization
Objective: 2
AACSB: Reflective thinking

8) The benefits of a decentralized organization are greater when a company:
A) is large and unregulated
B) is facing great uncertainties in their environment
C) has few interdependencies among division
D) All of these answers are correct.
Answer: D
Diff: 1
Terms: decentralization
Objective: 2
AACSB: Reflective thinking
9) A benefit of decentralization is that it creates better responsiveness to local needs.
Answer: TRUE
Diff: 2
Terms: decentralization
Objective: 2
AACSB: Reflective thinking

10) Decentralization can sometimes lead to suboptimal decisions.
Answer: TRUE
Diff: 2
Terms: decentralization
Objective: 2
AACSB: Reflective thinking

11) In a profit center, the manager is accountable for investments, revenues, and costs.
Answer: FALSE
Explanation: In an investment center, the manager is accountable for investments, revenues, and costs.
Diff: 2
Terms: decentralization
Objective: 2
AACSB: Reflective thinking

12) Suboptimal decision making is also called congruent decision making.
Answer: FALSE
Explanation: It's also called incongruent decision making.
Diff: 2
Terms: incongruent decision making, suboptimal decision making
Objective: 2
AACSB: Ethical reasoning

13) Surveys indicate that decisions made most frequently at the corporate level are related to sources of supplies and products to manufacture.
Answer: FALSE
Explanation: These decisions are made at a decentralized level.
Diff: 2
Terms: decentralization
Objective: 2
AACSB: Ethical reasoning

14) An important advantage of decentralized operations is that it improves corporate control.
Answer: FALSE
Explanation: Decentralized operations weaken controls.
Diff: 1
Terms: decentralization
Objective: 2
AACSB: Reflective thinking
15) Autonomy is the freedom for managers at lower levels of the organization to make decisions.
Answer: FALSE
Explanation: Decentralization is the freedom for managers at lower levels of the organization to make decisions.
Diff: 2
Terms: decentralization, autonomy
Objective: 2
AACSB: Reflective thinking

16) For each of the following activities, characteristics, and applications, identify whether they can be found in a centralized organization, a decentralized organization, or both types of organizations.

a. Freedom for managers at lower organizational levels to make decisions
b. Gathering information may be very expensive
c. Greater responsiveness to user needs
d. Have few interdependencies among divisions
e. Maximum constraints and minimum freedom for managers at lowest levels
f. Maximization of benefits over costs
g. Minimization of duplicate functions
h. Minimum of suboptimization
i. Multiple responsibility centers with various reporting units
j. Profit centers

Answer:
a. Decentralization
b. Decentralization
c. Decentralization
d. Decentralization
e. Centralization
f. Both
g. Centralization
h. Centralization
i. Both
j. Both
Diff: 2
Terms: decentralization
Objective: 2
AACSB: Analytical skills
17) The president of Silicon Company has just returned from a week of professional development courses and is very excited that she will not have to change the organization from a centralized structure to a decentralized structure just to have responsibility centers. However, she is somewhat confused about how responsibility centers relate to centralized organizations where a few managers have most of the authority.

**Required:**

Explain how a centralized organization might allow for responsibility centers.

**Answer:** It does not make any difference what type of organizational structure exists when it comes to defining responsibility centers. If a centralized organization desires to hold its managers responsible for their actions, it can design a reporting system that assigns all costs and revenues to their controllable managers. It's just that, in a centralized organization, each manager may have more items to control than are reasonably possible.

**Diff:** 2

**Terms:** management control system, decentralization

**Objective:** 2

**AACSB:** Reflective thinking

**Objective 22.3**

1) A product may be passed from one subunit to another subunit in the same organization. The product is known as a(n):

A) interdepartmental product
B) intermediate product
C) subunit product
D) transfer product

**Answer:** B

**Diff:** 1

**Terms:** intermediate product

**Objective:** 3

**AACSB:** Reflective thinking

2) Transfer prices should be judged by whether they promote:

A) goal congruence.
B) the balanced scorecard method.
C) a high level of subunit autonomy in decision making.
D) Both A and C are correct.

**Answer:** D

**Diff:** 2

**Terms:** transfer price, goal congruence, autonomy

**Objective:** 3

**AACSB:** Reflective thinking
3) A transfer-pricing method leads to goal congruence when managers:
A) always act in their own best interest
B) act in their own best interest and the decision is in the long-term best interest of the manager's subunit
C) act in their own best interest and the decision is in the long-term best interest of the company
D) act in their own best interest and the decision is in the short-term best interest of the company
Answer: C

4) Negotiated transfer prices are often employed when:
A) market prices are stable
B) market prices are volatile
C) market prices change by a regular percentage each year
D) goal congruence is not a major objective
Answer: B

5) The costs used in cost-based transfer prices:
A) are actual costs
B) are budgeted costs
C) can either be actual or budgeted costs
D) are lower than the market-based transfer prices
Answer: C

Answer the following questions using the information below:

Penn Oil Corporation has two divisions, Refining and Production. The company's primary product is Luboil Oil. Each division's costs are provided below:

<table>
<thead>
<tr>
<th>Division</th>
<th>Variable costs per barrel of oil</th>
<th>Fixed costs per barrel of oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>$9</td>
<td>$6</td>
</tr>
<tr>
<td>Refining</td>
<td>$30</td>
<td>$36</td>
</tr>
</tbody>
</table>

The Refining Division has been operating at a capacity of 40,000 barrels a day and usually purchases 25,000 barrels of oil from the Production Division and 15,000 barrels from other suppliers at $60 per barrel.
6) What is the transfer price per barrel from the Production Division to the Refining Division, assuming the method used to place a value on each barrel of oil is 180% of variable costs?
A) $16.20
B) $27.00
C) $54.00
D) $70.20
Answer: A
Explanation: A) 1.8 × $9 = $16.20
Diff: 2
Terms: transfer price
Objective: 3
AACSB: Analytical skills

7) What is the transfer price per barrel from the Production Division to the Refining Division, assuming the method used to place a value on each barrel of oil is 110% of full costs?
A) $16.50
B) $66.00
C) $72.60
D) $89.10
Answer: A
Explanation: A) 1.10 × ($9 + $6) = $16.50
Diff: 2
Terms: transfer price
Objective: 3
AACSB: Analytical skills

8) Assume 200 barrels are transferred from the Production Division to the Refining Division for a transfer price of $18 per barrel. The Refining Division sells the 200 barrels at a price of $120 each to customers. What is the operating income of both divisions together?
A) $7,200
B) $7,800
C) $10,800
D) $20,400
Answer: B
Explanation: B) Revenues = ($120 × 200) = $24,000
Cost = ($9 + $6 + $30 + $36) × 200 = (16,200)
Operating income $7,800
Diff: 3
Terms: transfer price
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

Greenlawn Corporation has two divisions, Distribution and Production. The company's primary product is fertilizer. Each division's costs are provided below:

<table>
<thead>
<tr>
<th></th>
<th>Variable costs per pound</th>
<th>$0.10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production</td>
<td>Fixed costs per pound</td>
<td>$0.50</td>
</tr>
<tr>
<td>Distribution</td>
<td>Variable costs per pound</td>
<td>$0.06</td>
</tr>
<tr>
<td></td>
<td>Fixed costs per pound</td>
<td>$0.04</td>
</tr>
</tbody>
</table>

The Distribution Division has been operating at a capacity of 4,000,000 pounds a week and usually purchases 2,000,000 pounds from the Production Division and 2,000,000 pounds from other suppliers at $0.90 per pound.

9) What is the transfer price per barrel from the Production Division to the Distribution Division, assuming the method used to place a value on each pound of fertilizer is 160% of variable costs?
   A) $0.10
   B) $0.22
   C) $0.16
   D) $0.80
   Answer: C
   Explanation: C) \(1.6 \times \$0.10 = \$0.16\)
   Diff: 2
   Terms: transfer price
   Objective: 3
   AACSB: Analytical skills

10) What is the transfer price per barrel from the Production Division to the Distribution Division, assuming the method used to place a value on each pound of fertilizer is 120% of full costs?
    A) $0.60
    B) $0.72
    C) $0.90
    D) $1.10
    Answer: B
    Explanation: B) \(1.20 \times (\$0.10 + \$0.50) = \$0.72\)
    Diff: 2
    Terms: transfer price
    Objective: 3
    AACSB: Analytical skills
11) Assume 100,000 pounds are transferred from the Production Division to the Distribution Division for a transfer price of $0.80 per pound. The Distribution Division sells the 100,000 pounds at a price of $1.10 each to customers. What is the operating income of both divisions together?
A) $20,000
B) $30,000
C) $40,000
D) $50,000
Answer:  C
Explanation:
C) Revenues = ($1.10 × 100,000) = $110,000
Cost = ($0.10 + $0.50 + $0.06 + $0.04) ×100,000 = (70,000)
   Operating income $40,000
Diff: 3
Terms:  transfer price
Objective:  3
AACSB:  Analytical skills
Answer the following questions using the information below:

Calculate the Division operating income for the AlphaShoe Company which manufactures only one type of shoe and has two divisions, the Sole Division, and the Assembly Division. The Sole Division manufactures soles for the Assembly Division, which completes the shoe and sells it to retailers. The Sole Division "sells" soles to the Assembly Division. The market price for the Assembly Division to purchase a pair of soles is $40. (Ignore changes in inventory.) The fixed costs for the Sole Division are assumed to be the same over the range of 40,000-100,000 units. The fixed costs for the Assembly Division are assumed to be $14 per pair at 100,000 units.

*Sole's costs per pair of soles are:*
- Direct materials $8
- Direct labor $6
- Variable overhead $4
- Division fixed costs $2

*Assembly's costs per completed pair of shoes are:*
- Direct materials $12
- Direct labor $4
- Variable overhead $2
- Division fixed costs $14

12) What is the market-based transfer price per pair of soles from the Sole Division to the Assembly Division?
   A) $20
   B) $32
   C) $40
   D) $52
   Answer: C
   Explanation: C) $40 as given in the problem.
   Diff: 2
   Terms: transfer price
   Objective: 3
   AACSB: Analytical skills

13) What is the transfer price per pair of soles from the Sole Division to the Assembly Division if the method used to place a value on each pair of soles is 180% of variable costs?
   A) $28.80
   B) $25.20
   C) $32.40
   D) $57.60
   Answer: C
   Explanation: C) $18 \times 1.8 = $32.40
   Diff: 2
   Terms: transfer price
   Objective: 3
   AACSB: Analytical skills
14) What is the transfer price per pair of shoes from the Sole Division to the Assembly Division per pair of soles if the transfer price per pair of soles is 125% of full costs?
A) $20
B) $25
C) $26
D) $30
Answer: B
Explanation: B) $20 \times 1.25 = $25
Diff: 2
Terms: transfer price
Objective: 3
AACSB: Analytical skills

15) Calculate and compare the difference in overall corporate net income between Scenario A and Scenario B if the Assembly Division sells 100,000 pairs of shoes for $120 per pair to customers.
   Scenario A: Negotiated transfer price of $30 per pair of soles
   Scenario B: Market-based transfer price
A) $1,000,000 more net income under Scenario A
B) $1,000,000 of net income using Scenario B
C) $200,000 of net income using Scenario A.
D) None of these answers is correct.
Answer: D
Explanation: D) The net income would be the same under both scenarios.
Diff: 3
Terms: transfer price
Objective: 3
AACSB: Analytical skills

16) Assume the transfer price for a pair of soles is 180% of total costs of the Sole Division and 40,000 of soles are produced and transferred to the Assembly Division. The Sole Division's operating income is:
A) $640,000
B) $720,000
C) $800,000
D) $880,000
Answer: A
Explanation:
A) Revenue ((1.8 \times $20) \times 40,000) = $1,440,000
Costs ($20 \times 40,000) = $(800,000)
Operating income $640,000
Diff: 3
Terms: transfer price
Objective: 3
AACSB: Analytical skills
17) If the Assembly Division sells 100,000 pairs of shoes at a price of $120 a pair to customers, what is the operating income of both divisions together?

A) $8,800,000  
B) $6,800,000  
C) $6,000,000  
D) $5,200,000

Answer: B

Explanation:

B) Revenues = ($120 × 100,000) = $12,000,000
Cost = ($52 × 100,000) = 5,200,000
Operating income = $6,800,000

Diff: 3

Terms: transfer price
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

Calculate the Division operating income for the Artic Air Company which manufactures only one type of air conditioner and has two divisions, the Compressor Division, and the Assembly Division. The Compressor Division manufactures compressors for the Assembly Division, which completes the air conditioner and sells it to retailers. The Compressor Division "sells" compressors to the Assembly Division. The market price for the Assembly Division to purchase a compressor is $38.50. (Ignore changes in inventory.) The fixed costs for the Compressor Division are assumed to be the same over the range of 5,000-10,000 units. The fixed costs for the Assembly Division are assumed to be $7.50 per unit at 10,000 units.

**Compressor's costs per compressor are:**
- Direct materials $17.00
- Direct labor $7.25
- Variable overhead $3.00
- Division fixed costs $7.50

**Assembly's costs per completed air conditioner are:**
- Direct materials $150.00
- Direct labor $62.50
- Variable overhead $20.00
- Division fixed costs $7.50

18) What is the market-based transfer price per compressor from the Compressor Division to the Assembly Division?
A) $17.00
B) $27.25
C) $34.75
D) $38.50
Answer: D
Explanation: D) $38.50 as given in the problem
Diff: 2
Terms: transfer price
Objective: 3
AACSB: Analytical skills

19) What is the transfer price per compressor from the Compressor Division to the Assembly Division if the method used to place a value on each compressor is 150% of variable costs?
A) $40.88
B) $38.50
C) $4.50
D) $36.38
Answer: A
Explanation: A) $(17.00 + 7.25 + 3.00) \times 1.5 = $40.88
Diff: 2
Terms: transfer price
Objective: 3
AACSB: Analytical skills
20) What is the transfer price per compressor from the Compressor Division to the Assembly Division if the transfer price per compressor is 110% of full costs?
A) $42.35
B) $40.00
C) $38.23
D) none of the items
Answer: C
Explanation: $ \left(17.00 + 7.25 + 3.00 + 7.50\right) \times 1.10 = $38.23
Diff: 2
Terms: transfer price
Objective: 3
AACSB: Analytical skills

21) Assume the transfer price for a compressor is 150% of total costs of the Compressor Division and 1,000 of the compressors are produced and transferred to the Assembly Division. The Compressor Division's operating income is:
A) $15,875
B) $16,375
C) $17,375
D) $18,250
Answer: C
Explanation:
\begin{align*}
\text{Revenue} &= (1.5 \times (17.00 + 7.25 + 3.00 + 7.50) \times 1,000) = $52,125 \\
\text{Costs} &= (34.75 \times 1,000) = $34,750 \\
\text{Operating income} &= $17,375
\end{align*}
Diff: 3
Terms: transfer price
Objective: 3
AACSB: Analytical skills

22) If the Assembly Division sells 1,000 air conditioners at a price of $375.00 per air conditioner to customers, what is the operating income of both divisions together?
A) $100,250
B) $103,500
C) $97,000
D) $82,875
Answer: A
Explanation:
\begin{align*}
\text{Revenues} &= (375 \times 1,000) = $375,000 \\
\text{Cost} &= (34.75 + 240.00) \times 1,000) = $274,750 \\
\text{Operating income} &= $100,250
\end{align*}
Diff: 3
Terms: transfer price
Objective: 3
AACSB: Analytical skills
Answer the following questions using the information below:

Division A sells ground veal internally to Division B, which in turn, produces veal burgers that sell for $10 per pound. Division A incurs costs of $1.50 per pound while Division B incurs additional costs of $5.00 per pound.

23) What is Division A's operating income per pound, assuming the transfer price of the ground veal is set at $2.50 per pound?
   A) $1.00  
   B) $1.75  
   C) $2.50  
   D) $3.25
   Answer: A
   Explanation: A) $2.50 - $1.50 = $1.00
   Diff: 2  
   Terms: transfer price  
   Objective: 3  
   AACSB: Analytical skills

24) Which of the following formulas correctly reflects the company's operating income per pound?
   A) $10.00 - ($1.50 + $5.00) = $3.50  
   B) $10.00 - ($2.50 + $5.00) = $2.50  
   C) $10.00 - ($1.50 + $7.50) = $1.00  
   D) $10.00 - ($0.50 + $2.50 + $7.00) = 0
   Answer: A
   Explanation: A) $10.00 - ($1.50 + $5.00) = $3.50
   Diff: 2  
   Terms: transfer price  
   Objective: 3  
   AACSB: Analytical skills

25) A transfer price is the price one subunit charges for a product or service supplied to another subunit of the same organization.
   Answer: TRUE
   Diff: 1  
   Terms: transfer price  
   Objective: 3  
   AACSB: Analytical skills

26) The choice of a transfer-pricing method has minimal effect on the allocation of company-wide operating income among divisions.
   Answer: FALSE
   Explanation: The choice of a transfer-pricing method has a large effect.
   Diff: 2  
   Terms: transfer price  
   Objective: 3  
   AACSB: Reflective thinking
27) No matter how low the transfer price, the manager of the selling division should sell the division's product to other company divisions in the interests of overall company profitability.
Answer: FALSE
Explanation: The manager of the selling division should maximize overall company profitability by selling the product at the highest possible price.
Diff: 2
Terms: transfer price
Objective: 3
AACSB: Ethical reasoning

28) The costs used in cost-based transfer prices can only be budgeted costs.
Answer: FALSE
Explanation: The costs can also be actual costs.
Diff: 2
Terms: transfer price
Objective: 3
AACSB: Reflective thinking

29) A perfectly competitive market exists when there is a homogeneous product with buying prices equal to selling prices and no individual buyers or sellers can affect those prices by their own actions.
Answer: TRUE
Diff: 2
Terms: perfectly competitive market
Objective: 3
AACSB: Reflective thinking
30) For each of the following, identify whether it BEST relates to market-based, cost-based, negotiated, or all types of transfer pricing.

a. Bargaining between selling and buying units
b. Budgeted costs
c. 145% of full costs
d. Internal product transfers are required if goods are available internally
e. Manufacturing costs plus marketing costs plus distribution costs plus customer service costs
f. Prices listed in a trade journal
g. Selling price less normal sales commissions
h. Variable manufacturing cost plus a markup

Answer:
a. Negotiated
b. Cost-based
c. Cost-based
d. Any method
e. Cost-based
f. Market-based
g. Market-based
h. Cost-based

Diff: 2
Terms: transfer price
Objective: 3
AACSB: Analytical skills
31) For each of the following statements regarding the satisfaction of transfer pricing criteria, identify whether you would expect the transfer pricing method to meet the criteria. Provide a yes, no, or sometimes for each situation.

__________ a. Market-Based transfer pricing achieves goal congruence.
__________ b. Cost-Based transfer pricing achieves goal congruence.
__________ c. Negotiated transfer pricing achieves goal congruence.
__________ d. Market-Based transfer pricing motivates management effort.
__________ e. Cost-Based transfer pricing motivates management effort.
__________ f. Negotiated transfer pricing motivates management effort.
__________ g. Market-Based transfer pricing is useful for evaluating subunit performance.
__________ h. Cost-Based transfer pricing is useful for evaluating subunit performance.
__________ i. Negotiated transfer pricing is useful for evaluating subunit performance.
__________ j. Market-Based transfer pricing preserves subunit autonomy.
__________ k. Cost-Based transfer pricing preserves subunit autonomy.
__________ l. Negotiated transfer pricing preserves subunit autonomy.

Answer:
a. Yes
b. Sometimes
c. Yes
d. Yes
e. Yes
f. Yes
g. Yes
h. Sometimes
i. Yes
j. Yes
k. No
l. Yes

Diff: 2
Terms: transfer price
Objective: 3
AACSB: Analytical skills
32) The Mill Flow Company has two divisions. The Cutting Division prepares timber at its sawmills. The Assembly Division prepares the cut lumber into finished wood for the furniture industry. No inventories exist in either division at the beginning of 20X5. During the year, the Cutting Division prepared 60,000 cords of wood at a cost of $660,000. All the lumber was transferred to the Assembly Division, where additional operating costs of $6 per cord were incurred. The 600,000 boardfeet of finished wood were sold for $2,500,000.

Required:

a. Determine the operating income for each division if the transfer price from Cutting to Assembly is at cost - $11 a cord.

b. Determine the operating income for each division if the transfer price is $9 per cord.

c. Since the Cutting Division sells all of its wood internally to the Assembly Division, does the manager care what price is selected? Why? Should the Cutting Division be a cost center or a profit center under the circumstances?

Answer:

a. | | Cutting | Assembly |
---|---|---|---|
Revenue | | $660,000* | $2,500,000 |
Cost of services: | | | |
Incurred | | $ 660,000 | $ 360,000 |
Transferred-in | | 0 | 660,000 |
Total | | $ 660,000 | $1,020,000 |
Operating income | | 0 | $1,480,000 |

* 60,000 cords × $11 = $660,000

b. | | Cutting | Assembly |
---|---|---|---|
Revenue | | $540,000* | $2,500,000 |
Cost of services: | | | |
Incurred | | $ 660,000 | $ 360,000 |
Transferred-in | | 0 | 540,000 |
Total | | $ 660,000 | $900,000 |
Operating income | | $(120,000) | $1,600,000 |

* 60,000 cords × $9 = $540,000

c. The manager of Cutting cares about the transfer price if the division is a profit center but not if it is a cost center. Under the circumstances, the division probably should be a cost center and not worry about the profit it pretends to make by selling to another division.

Diff: 2
Terms: transfer price
Objective: 3
AACSB: Analytical skills
33) Sandra's Sheet Metal Company has two divisions. The Raw Material Division prepares sheet metal at its warehouse facility. The Fabrication Division prepares the cut sheet metal into finished products for the air conditioning industry. No inventories exist in either division at the beginning of 20X8. During the year, the Raw Material Division prepared 450,000 square feet of sheet metal at a cost of $1,800,000. All the sheet metal was transferred to the Fabrication Division, where additional operating costs of $1.50 per square foot were incurred. The 450,000 square feet of finished fabricated sheet metal products were sold for $3,875,000.

**Required:**

a. Determine the operating income for each division if the transfer price from Raw Material to Fabrication is at a cost of $4 per square foot.

b. Determine the operating income for each division if the transfer price is $5 per square foot.

c. Since the Raw Materials Division sells all of its sheet metal internally to the Fabrication Division, does the Raw Materials manager care what price is selected? Why? Should the Raw Materials Division be a cost center or a profit center under the circumstances?

**Answer:**

**a.**

<table>
<thead>
<tr>
<th></th>
<th>Raw Material</th>
<th>Fabrication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>$1,800,000*</td>
<td>$3,875,000</td>
</tr>
<tr>
<td>Cost of services:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incurred</td>
<td>$1,800,000</td>
<td>$675,000</td>
</tr>
<tr>
<td>Transferred-in</td>
<td>0</td>
<td>1,800,000</td>
</tr>
<tr>
<td>Total</td>
<td>$1,800,000</td>
<td>$2,475,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$0</td>
<td>$1,400,000</td>
</tr>
</tbody>
</table>

* 60,000 cords × $11 = $660,000

**b.**

<table>
<thead>
<tr>
<th></th>
<th>Cutting</th>
<th>Assembly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>$2,250,000*</td>
<td>$3,875,000</td>
</tr>
<tr>
<td>Cost of services:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incurred</td>
<td>$1,800,000</td>
<td>$675,000</td>
</tr>
<tr>
<td>Transferred-in</td>
<td>0</td>
<td>2,250,000</td>
</tr>
<tr>
<td>Total</td>
<td>$1,800,000</td>
<td>$2,925,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$450,000</td>
<td>$950,000</td>
</tr>
</tbody>
</table>

* 60,000 cords × $9 = $540,000

**c.** The manager of Raw materials cares about the transfer price if the division is a profit center but not if it is a cost center. Under the circumstances, the division probably should be a cost center and should not worry about the profit it pretends to make by selling to another division.

Diff: 2
Terms: transfer price
Objective: 3
AACSB: Analytical skills
34) Bedtime Bedding Company manufactures pillows. The Cover Division makes covers and the Assembly Division makes the finished products. The covers can be sold separately for $5.00. The pillows sell for $6.00. The information related to manufacturing for the most recent year is as follows:

<table>
<thead>
<tr>
<th></th>
<th>Cover Division manufacturing costs</th>
<th>$6,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales of covers by Cover Division</td>
<td></td>
<td>4,000,000</td>
</tr>
<tr>
<td>Market value of covers transferred to Assembly</td>
<td></td>
<td>6,000,000</td>
</tr>
<tr>
<td>Sales of pillows by Assembly Division</td>
<td></td>
<td>7,200,000</td>
</tr>
<tr>
<td>Additional manufacturing costs of Assembly Division</td>
<td></td>
<td>1,500,000</td>
</tr>
</tbody>
</table>

**Required:**
Compute the operating income for each division and the company as a whole. Use market value as the transfer price. Are all managers happy with this concept? Explain.

**Answer:**

<table>
<thead>
<tr>
<th></th>
<th>Cover</th>
<th>Assembly</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External</td>
<td>$4,000,000</td>
<td>$7,200,000</td>
<td>$11,200,000</td>
</tr>
<tr>
<td>Internal</td>
<td>6,000,000</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$10,000,000</td>
<td>$7,200,000</td>
<td>$11,200,000</td>
</tr>
<tr>
<td><strong>Cost of goods:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incurred</td>
<td>$6,000,000</td>
<td>$1,500,000</td>
<td>$7,500,000</td>
</tr>
<tr>
<td>Transferred-in</td>
<td>0</td>
<td>6,000,000</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$6,000,000</td>
<td>$7,500,000</td>
<td>$7,500,000</td>
</tr>
<tr>
<td><strong>Operating income</strong></td>
<td>$4,000,000</td>
<td>$(300,000)</td>
<td>$3,700,000</td>
</tr>
</tbody>
</table>

The Assembly manager is probably not happy because the division is showing a loss. The manager would probably argue for a transfer price at something less than market price. However, since the market is open and competitive, the market price can be justified. The division needs to either increase its price or reduce its costs if it expects to show a profit.

Diff: 3
Terms: transfer price
Objective: 3
AACSB: Analytical skills
35) DesMoines Valley Company has two divisions, Computer Services and Management Advisory Services. In addition to their external customers, each division performs work for the other division. The external fees earned by each division in 20X5 were $200,000 for Computer Services and $350,000 for Management Advisory Services. Computer Services worked 3,000 hours for Management Advisory Services, who, in turn, worked 1,200 hours for Computer Services. The total costs of external services performed by Computer Services were $110,000 and $240,000 by Management Advisory Services.

**Required:**

a. Determine the operating income for each division and for the company as a whole if the transfer price from Computer Services to Management Advisory Services is $15 per hour and the transfer price from Management Advisory Services to Computer Services is $12.50 per hour.

b. Determine the operating income for each division and for the company as a whole if the transfer price between divisions is $15 per hour.

c. What are the operating income results for each division and for the company as a whole if the two divisions net the hours worked for each other and charge $12.50 per hour for the one with the excess? Which division manager prefers this arrangement?

**Answer:**

a.

<table>
<thead>
<tr>
<th>Revenue:</th>
<th>Computer</th>
<th>Management</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>External</td>
<td>$200,000</td>
<td>$350,000</td>
<td>$550,000</td>
</tr>
<tr>
<td>Internal</td>
<td>45,000</td>
<td>15,000</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>$245,000</td>
<td>$365,000</td>
<td>$550,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost of services:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Incurred</td>
<td>$110,000</td>
<td>$240,000</td>
<td>$350,000</td>
</tr>
<tr>
<td>Transferred-in</td>
<td>15,000</td>
<td>45,000</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>$125,000</td>
<td>$285,000</td>
<td>$350,000</td>
</tr>
</tbody>
</table>

| Operating income | $120,000 | $80,000    | $200,000 |

* Computer Services = 3,000 hours × $15 = $45,000
Management Advisory Services = 1,200 hours × $12.50 = $15,000
Revenue for one is an expense of the other.

b.

<table>
<thead>
<tr>
<th>Revenue:</th>
<th>Computer</th>
<th>Management</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>External</td>
<td>$200,000</td>
<td>$350,000</td>
<td>$550,000</td>
</tr>
<tr>
<td>Internal</td>
<td>45,000</td>
<td>18,000</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>$245,000</td>
<td>$368,000</td>
<td>$550,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cost of services:</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Incurred</td>
<td>$110,000</td>
<td>$240,000</td>
<td>$350,000</td>
</tr>
<tr>
<td>Transferred-in</td>
<td>18,000</td>
<td>45,000</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>$128,000</td>
<td>$285,000</td>
<td>$350,000</td>
</tr>
</tbody>
</table>

| Operating income | $117,000 | $83,000    | $200,000 |
* Computer Services = 3,000 hours × $15 = $45,000
Management Advisory Services = 1,200 hours × $15 = $18,000
Revenue for one is an expense of the other.

c.

<table>
<thead>
<tr>
<th></th>
<th>Computer</th>
<th>Management</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Revenue:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>External</td>
<td>$200,000</td>
<td>$350,000</td>
<td>$550,000</td>
</tr>
<tr>
<td>Internal</td>
<td>22,500</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$222,500</td>
<td>$350,000</td>
<td>$550,000</td>
</tr>
<tr>
<td><strong>Cost of services:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incurred</td>
<td>$110,000</td>
<td>$240,000</td>
<td>$350,000</td>
</tr>
<tr>
<td>Transferred-in</td>
<td>0</td>
<td>22,500</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$110,000</td>
<td>$262,500</td>
<td>$350,000</td>
</tr>
<tr>
<td><strong>Operating income</strong></td>
<td>$112,500</td>
<td>$87,500</td>
<td>$200,000</td>
</tr>
</tbody>
</table>

* Computer Services net = (3,000 - 1,200) × $12.50 = $22,500
Revenue for one is an expense of the other.

The manager of Computer Services favors this procedure for the current year. If the hours are always in favor of Computer Services, the manager of Computer Services will favor this procedure.

Diff: 2
Terms: transfer price
Objective: 3
AACSB: Analytical skills
36) Better Food Company recently acquired an olive oil processing company that has an annual capacity of 2,000,000 liters and that processed and sold 1,400,000 liters last year at a market price of $4 per liter. The purpose of the acquisition was to furnish oil for the Cooking Division. The Cooking Division needs 800,000 liters of oil per year. It has been purchasing oil from suppliers at the market price. Production costs at capacity of the olive oil company, now a division, are as follows:

<table>
<thead>
<tr>
<th>Direct materials per liter</th>
<th>$1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct processing labor</td>
<td>0.50</td>
</tr>
<tr>
<td>Variable processing overhead</td>
<td>0.24</td>
</tr>
<tr>
<td>Fixed processing overhead</td>
<td>0.40</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$2.14</strong></td>
</tr>
</tbody>
</table>

Management is trying to decide what transfer price to use for sales from the newly acquired company to the Cooking Division. The manager of the Olive Oil Division argues that $4, the market price, is appropriate. The manager of the Cooking Division argues that the cost of $2.14 should be used, or perhaps a lower price, since fixed overhead cost should be recomputed with the larger volume. Any output of the Olive Oil Division not sold to the Cooking Division can be sold to outsiders for $4 per liter.

**Required:**

a. Compute the operating income for the Olive Oil Division using a transfer price of $4.

b. Compute the operating income for the Olive Oil Division using a transfer price of $2.14.

c. What transfer price(s) do you recommend? Compute the operating income for the Olive Oil Division using your recommendation.

**Answer:**

a. Sales:

<table>
<thead>
<tr>
<th>Sales</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>External (1,200,000 × $4)</td>
<td>$4,800,000</td>
</tr>
<tr>
<td>Internal (800,000 × $4)</td>
<td>3,200,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$8,000,000</td>
</tr>
</tbody>
</table>

Cost of goods sold:

<table>
<thead>
<tr>
<th>Cost of goods sold</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable (2,000,000 × $1.74)</td>
<td>$3,480,000</td>
</tr>
<tr>
<td>Fixed (2,000,000 × $0.40)</td>
<td>800,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$4,280,000</td>
</tr>
</tbody>
</table>

Operating income

$3,720,000

d. Sales:

<table>
<thead>
<tr>
<th>Sales</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>External (1,200,000 × $4)</td>
<td>$4,800,000</td>
</tr>
<tr>
<td>Internal (800,000 × $2.14)</td>
<td>1,712,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$6,512,000</td>
</tr>
</tbody>
</table>

Cost of goods sold:

<table>
<thead>
<tr>
<th>Cost of goods sold</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable (2,000,000 × $1.74)</td>
<td>$3,480,000</td>
</tr>
<tr>
<td>Fixed (2,000,000 × $0.40)</td>
<td>800,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$4,280,000</td>
</tr>
</tbody>
</table>

Operating income

$2,232,000
c. Due to current demand in excess of the capacity, the Olive Oil Division should not be penalized by having to sell inside. All sales equivalent to the current external demand of 1,400,000 liters should be at the market price.

<table>
<thead>
<tr>
<th>Demand and Excess</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current external demand</td>
<td>1,400,000</td>
</tr>
<tr>
<td>Current internal demand</td>
<td>800,000</td>
</tr>
<tr>
<td>Total demand</td>
<td>2,200,000</td>
</tr>
<tr>
<td>Capacity</td>
<td>2,000,000</td>
</tr>
<tr>
<td>Excess demand</td>
<td>200,000</td>
</tr>
<tr>
<td>Internal demand</td>
<td>800,000</td>
</tr>
<tr>
<td>Noncompetitive internal demand</td>
<td>600,000</td>
</tr>
</tbody>
</table>

Sales:
- External (1,200,000 × $4) $4,800,000
- Internal (200,000 × $4) 800,000
- Internal (600,000 × $2.14) 1,284,000

Cost of goods sold:
- Variable (2,000,000 × $1.74) $3,480,000
- Fixed (2,000,000 × $0.40) 800,000
- Operating income $2,604,000

Diff: 3
Terms: transfer price
Objective: 3
AACSB: Analytical skills

37) Explain what transfer prices are, and what are the four criteria used to evaluate them?
Answer: Transfer prices are the prices that one subunit of the firm charges another subunit of the firm for a good or service. Transfer prices are evaluated based on firm goal congruence, management efforts, subunit performance evaluations, and the subunit autonomy.

Diff: 2
Terms: transfer price
Objective: 3
AACSB: Reflective thinking

38) Briefly explain each of the three methods used to determine a transfer price.
Answer: Transfer prices can be calculated using an external market price. They could be calculated using a cost basis, and perhaps including a markup. They could also be calculated using a negotiated price between the buying and selling divisions.

Diff: 2
Terms: transfer price
Objective: 3
AACSB: Reflective thinking
Objective 22.4

1) Transferring products or services at market prices generally leads to optimal decisions when:
A) the market for the intermediate product is perfectly competitive
B) the interdependencies of the subunits are minimal
C) there are no additional costs or benefits to the company in buying or selling in the external market
D) All of these answers are correct.
Answer: D
Diff: 2
Terms: transfer price, suboptimal decision making, perfectly competitive market
Objective: 4
AACSB: Reflective thinking

2) A benefit of using a market-based transfer price is the:
A) profits of the transferring division are sacrificed for the overall good of the corporation
B) profits of the division receiving the products are sacrificed for the overall good of the corporation
C) economic viability and profitability of each division can be evaluated individually
D) None of these answers is correct.
Answer: C
Diff: 2
Terms: transfer price
Objective: 4
AACSB: Reflective thinking

3) When an industry has excess capacity, market prices may drop well below their historical average. If this drop is temporary, it is called:
A) distress prices
B) dropped prices
C) low-average prices
D) substitute prices
Answer: A
Diff: 1
Terms: transfer price
Objective: 4
AACSB: Reflective thinking

4) Cost-based transfer prices are helpful when:
A) a market exists for the product
B) a price is easy to obtain
C) the product is unique
D) All of these answers are correct.
Answer: C
Diff: 2
Terms: transfer price
Objective: 4
AACSB: Reflective thinking
5) Briefly describe the conditions that should be met for market-based transfer pricing to lead to optimal decision making among subunits of a large organization.
Answer: The conditions for which market-based transfer pricing is likely to lead to optimal decision making are: (1) the market for the intermediate product is perfectly competitive, (2) interdependencies of the subunits are minimal, and (3) there are no additional costs or benefits to the company as a whole from buying or selling in the external market instead of transacting internally.

In a perfectly competitive market, the market-based transfer prices promote goal congruence, motivate the management to take the same actions as if they were transacting externally, evaluate subunit performance, and preserve subunit autonomy.

Diff: 2
Terms: transfer pricing, market-based
Objective: 4
AACSB: Reflective thinking

Objective 22.5

1) Optimal corporate decisions do NOT result when goods or services are transferred at:
A) market prices
B) full-cost prices
C) variable-cost prices
D) Either B or C is correct.
Answer: D
Diff: 2
Terms: transfer price, suboptimal decision making
Objective: 5
AACSB: Reflective thinking

2) When companies do NOT want to use market prices or find it too costly, they typically use ________ prices, even though suboptimal decisions may occur.
A) average-cost
B) full-cost
C) long-run cost
D) short-run average cost
Answer: B
Diff: 2
Terms: transfer price
Objective: 5
AACSB: Reflective thinking
3) Crush Company makes internal transfers at 180% of full cost. The Soda Refining Division purchases 30,000 containers of carbonated water per day, on average, from a local supplier, who delivers the water for $30 per container via an external shipper. To reduce costs, the company located an independent supplier in Missouri who is willing to sell 30,000 containers at $20 each, delivered to Crush Company's Shipping Division in Missouri. The company's Shipping Division in Missouri has excess capacity and can ship the 30,000 containers at a variable cost of $2.50 per container. What is the total cost to Crush Company if the carbonated water is purchased from the local supplier?
A) $ 900,000
B) $1,200,000
C) $1,501,000
D) $1,620,000
Answer: A
Explanation: A) 30,000 containers × $30 = $900,000
Diff: 2
Terms: transfer price
Objective: 5
AACSB: Analytical skills

4) Crush Company makes internal transfers at 160% of full cost. The Soda Refining Division purchases 40,000 containers of carbonated water per day, on average, from a local supplier, who delivers the water for $40 per container via an external shipper. To reduce costs, the company located an independent supplier in Illinois who is willing to sell 40,000 containers at $30 each, delivered to Crush Company's Shipping Division in Missouri. The company's Shipping Division in Missouri has excess capacity and can ship the 40,000 containers at a variable cost of $4.50 per container. What is the total cost of purchasing the water from the Illinois supplier and shipping it to the Soda Division?
A) $1,200,000
B) $1,380,000
C) $1,600,000
D) $180,000
Answer: B
Explanation: B) 40,000 containers × ($4.50 + $30.00) = $1,380,000
Diff: 2
Terms: transfer price
Objective: 5
AACSB: Analytical skills

5) An advantage of using budgeted costs for transfer pricing among divisions is that:
A) overall corporate profitability is usually higher
B) it usually provides a basis for optimal decision making
C) the divisions know the transfer price in advance
D) it promotes subunit autonomy
Answer: C
Diff: 2
Terms: transfer price
Objective: 5
AACSB: Reflective thinking
6) The transfer-pricing method that reduces the goal-congruence problems associated with a pure cost-plus-based transfer-pricing method is:
   A) dual pricing
   B) market pricing
   C) single pricing
   D) Both A and B are correct.
   Answer: A
   Diff: 2
   Terms: transfer price, dual pricing, goal congruence
   Objective: 5
   AACSB: Reflective thinking

7) Dual pricing is NOT widely used in practice because:
   A) the manager of the supplying division does not have sufficient incentive to control costs
   B) it increases goal congruence
   C) managers are not insulated from the frictions of the market place
   D) Both B and C are correct.
   Answer: A
   Diff: 2
   Terms: dual pricing
   Objective: 5
   AACSB: Reflective thinking

8) Cost based transfer prices are the only price that a firm should use when transferring goods from one subunit to another subunit.
   Answer: FALSE
   Explanation: Cost based transfer prices are not the only price that a firm should use when transferring goods from one subunit to another.
   Diff: 2
   Terms: transfer price
   Objective: 5
   AACSB: Reflective thinking

9) A major advantage of using actual costs for transfer prices is that often inefficiencies are NOT passed along to the receiving division.
   Answer: FALSE
   Explanation: When actual costs are used inefficiencies are passed along to the receiving division.
   Diff: 2
   Terms: transfer price
   Objective: 5
   AACSB: Reflective thinking

10) Dual pricing reduces the goal-congruence problem associated with a pure cost-based transfer-pricing method.
    Answer: TRUE
    Diff: 2
    Terms: dual pricing, goal congruence
    Objective: 5
    AACSB: Reflective thinking
11) Cost-based transfer pricing is a better method when the products being transferred are specialized in nature.
Answer: TRUE
Diff: 2
Terms: decentralization
Objective: 5
AACSB: Reflective thinking

12) A firm using a cost-based transfer price will never have the selling division be able to achieve goal congruence.
Answer: FALSE
Explanation: A firm using a cost-based transfer price can have the selling division be able to achieve goal congruence.
Diff: 2
Terms: transfer price
Objective: 5
AACSB: Reflective thinking

13) Sportswear Company manufactures sneakers. The Athletic Division sells its socks for $18 a pair to outsiders. Sneakers have manufacturing costs of $7.50 each for variable and $4.50 for fixed. The division's total fixed manufacturing costs are $315,000 at the normal volume of 70,000 units.

The European Division has offered to buy 15,000 Sneakers at the full cost of $12. The Athletic Division has excess capacity and the 15,000 units can be produced without interfering with the current outside sales of 70,000. The 85,000 volume is within the division's relevant operating range.

Explain whether the Athletic Division should accept the offer.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Answer: Sales</td>
<td>$12.00</td>
</tr>
<tr>
<td>Variable costs</td>
<td>7.50</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$4.50</td>
</tr>
</tbody>
</table>

The proposal should be accepted because it makes a contribution to fixed costs and profits of $4.50 per unit. This would increase the division's operating income by $67,500 = ($4.50 \times 15,000 units).

Diff: 2
Terms: transfer price
Objective: 5
AACSB: Analytical skills
14) Xenon Autocar Company manufactures automobiles. The Fastback Car Division sells its cars for $50,000 each to the general public. The fastback cars have manufacturing costs of $25,000 each for variable and $15,000 each for fixed costs. The division's total fixed manufacturing costs are $75,000,000 at the normal volume of 5,000 units.

The Coupe Car Division has been unable to meet the demand for its cars this year. It has offered to buy 1,000 cars from the Fastback Car Division at the full cost of $40,000. The Fastback Car Division has excess capacity and the 1,000 units can be produced without interfering with the current outside sales of 5,000. The 6,000 volume is within the division's relevant operating range.

Explain whether the Fastback Car Division should accept the offer.

| Answer: Unit Sales | $40,000 |
| Variable costs     | 25,000  |
| Contribution margin| $15,000 |

The proposal should be accepted because it makes a contribution to fixed costs and profits of $10,000 per unit. This would increase the division's operating income by $10,000,000 = ($10,000 × 1,000 units).

Diff: 2
Terms: transfer price
Objective: 5
AACSB: Analytical skills

15) Copperstone Company has two divisions. The Bottle Division produces products that have variable costs of $3 per unit. Its 20X5 sales were 150,000 to outsiders at $5 per unit and 40,000 units to the Mixing Division at 140% of variable costs. Under a dual transfer-pricing system, the Mixing Division pays only the variable cost per unit. The fixed costs of the Bottle Division are $125,000 per year.

Mixing sells its finished products to outside customers for $11.50 per unit. Mixing has variable costs of $2.50 per unit in addition to the costs from the Bottle Division. The annual fixed costs of Mixing were $85,000. There were no beginning or ending inventories during the year.

**Required:**
What are the operating incomes of the two divisions and the company as a whole for the year? Explain why the company's operating income is less than the sum of the two divisions' total income.
The internal sales are not included in the company's statement because the company cannot sell to itself. Therefore, it has to exclude $48,000 of dual pricing.

**Diff: 2**

**Terms: transfer price, dual pricing**

**Objective: 5**

**AACSB: Analytical skills**

16) When cost-based transfer pricing is used between subunits of a large organization, describe how to avoid making suboptimal decisions.

**Answer:** When market prices are unavailable or too costly to obtain, it is often appropriate to use cost-based transfer prices. In some cases, the supplying division will charge full cost (or full cost plus a markup) to the receiving division. This is not optimal, because it causes the receiving division to treat the transferred in full cost per unit as if it were a variable cost. Since the full cost includes an allocation for overhead, it is not all variable cost. As a result, the organization as a whole will make suboptimal decisions using this as a basis.

A more appropriate method would be to use a variable cost or incremental cost for the units being transferred between subunits within an organization.

In the event that the supplying organization is a profit center and has other external customers for its products, then there may be some accommodation made for prorating the difference between variable cost and full cost. This method would be superior to allowing a full cost (or full cost plus markup) method to be used. The objective is to have the organization as a whole act in a manner that will approximate competitive marketplace conditions as much as possible to promote cost efficiency in the long run.

**Diff: 2**

**Terms: transfer pricing, cost-based**

**Objective: 5**

**AACSB: Reflective thinking**
Objective 22.6

1) An advantage of a negotiated transfer price is the:
A) close relationship between the negotiated price and the market price
B) negotiated transfer price preserves divisional autonomy
C) negotiations usually do not require much time and energy
D) Both B and C are correct.
Answer: B
Diff: 2
Terms: transfer price
Objective: 6
AACSB: Reflective thinking

2) The range over which two divisions will negotiate a transfer price is:
A) between the supplying division's variable cost and the market price of the product
B) between the supplying division's variable cost and its full cost of the product
C) it could be anywhere above the supplying division's full cost of the product
D) between the supplying division's full cost and 180% above its full cost
Answer: A
Diff: 2
Terms: transfer price
Objective: 6
AACSB: Reflective thinking

3) A DISADVANTAGE of a negotiated transfer price is that:
A) each division manager must put forth effort to increase division operating income
B) negotiated transfer price preserves divisional autonomy
C) negotiations usually require much time and energy
D) Both B and C are correct.
Answer: C
Diff: 2
Terms: transfer price
Objective: 6
AACSB: Reflective thinking

4) The prices negotiated by two divisions of the same company usually have no specific relationship to either costs or market price.
Answer: TRUE
Diff: 2
Terms: transfer price
Objective: 6
AACSB: Analytical skills
5) One major advantage of negotiated transfer pricing is that it can be done with little time or effort. 
Answer: FALSE 
Explanation: The disadvantage of negotiated transfer pricing is the time and energy spent on the negotiations. 
Diff: 2 
Terms: transfer price 
Objective: 6 
AACSB: Reflective thinking

6) The Home Office Company makes all types of office desks. The Computer Desk Division is currently producing 10,000 desks per year with a capacity of 15,000. The variable costs assigned to each desk are $300 and annual fixed costs of the division are $900,000. The computer desk sells for $400.

The Executive Division wants to buy 5,000 desks at $280 for its custom office design business. The Computer Desk manager refused the order because the price is below variable cost. The executive manager argues that the order should be accepted because it will lower the fixed cost per desk from $90 to $60 and will take the division to its capacity, thereby causing operations to be at their most efficient level.

**Required:**
a. Should the order from the Executive Division be accepted by the Computer Desk Division? Why?
b. From the perspective of the Computer Desk Division and the company, should the order be accepted if the Executive Division plans on selling the desks in the outside market for $420 after incurring additional costs of $100 per desk? 
c. What action should the company president take?

**Answer:**
a. 

<table>
<thead>
<tr>
<th>Sales</th>
<th>$280</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable costs</td>
<td>300</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$(20)</td>
</tr>
</tbody>
</table>

The manager should not accept the order because it is below variable costs. It will generate a loss of $100,000 [5,000 units x $(20)]. This is a losing proposition in both the short run and long run.

b. What the Executive Division does with the desks after receiving them is of no consequence to the Computer Desk Division. However, the division will still object to the transfer price of $280. The company, on the other hand, will encourage the offer because it increases total company operating income by $100,000 = 5,000 × [$420 - ($300 + $100)].

c. If the company president wants the Executive Division to have the new business, it should arrange a dual-pricing system or else have negotiated prices between divisions. Dual pricing would allow the selling division to get a market value for the transfer and the buying division to get some type of cost-plus transfer price. The negotiated price would allow the buying and selling divisions to feel like they had a part in the final pricing decision.

Diff: 3 
Terms: transfer price 
Objective: 5, 6 
AACSB: Analytical skills
7) The Micro Division of Silicon Computers produces computer chips that are sold to the Personal Computer Division and to outsiders. Operating data for the Micro Division for 20X5 are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Internal Sales</th>
<th>External Sales</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>300,000 chips at $10</td>
<td>$3,000,000</td>
<td></td>
</tr>
<tr>
<td>200,000 chips at $12</td>
<td></td>
<td>$2,400,000</td>
</tr>
<tr>
<td>Variable expenses at $4</td>
<td>1,200,000</td>
<td>800,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$1,800,000</td>
<td>$1,600,000</td>
</tr>
<tr>
<td>Fixed cost (allocated in units)</td>
<td>$1,500,000</td>
<td>$1,000,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$300,000</td>
<td>$600,000</td>
</tr>
</tbody>
</table>

The Personal Computer Division has just received an offer from an outside supplier to furnish chips at $8.60 each. The manager of Micro Division is not willing to meet the $8.60 price. She argues that it costs her $9.00 to produce and sell each chip. Sales to outside customers are at a maximum of 200,000 chips.

**Required:**

a. Verify the Micro Division's $9.00 unit cost figure.
b. Should the Micro Division meet the outside price of $8.60? Explain.
c. Could the $8.60 price be met and still show a profit for the Micro Division sales to the Personal Computer Division? Show computations.

**Answer:**

a. 

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable costs</td>
<td>$4.00</td>
</tr>
<tr>
<td>Fixed costs</td>
<td></td>
</tr>
<tr>
<td>$1,500,000 + $1,000,000 / 500,000 units</td>
<td>5.00</td>
</tr>
<tr>
<td>Total unit costs</td>
<td>$9.00</td>
</tr>
</tbody>
</table>

b. Yes, because the contribution margin is positive ($8.60 - $4.00 = $4.60). If it loses the internal business, the other sales would have to absorb the fixed costs, which would force even higher external prices. The Micro Division manager does not have much bargaining power since the external sales are already at a maximum.

c. 

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales (300,000 × $8.60)</td>
<td>$2,580,000</td>
</tr>
<tr>
<td>Variable costs (300,000 × $4)</td>
<td>1,200,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>$1,380,000</td>
</tr>
<tr>
<td>Fixed costs (300,000 × $5.00)</td>
<td>$1,500,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>$ (120,000)</td>
</tr>
</tbody>
</table>

Internal sales will not show a profit. This assumes the fixed costs are still allocated at $5.00 per unit.

**Diff:** 2

**Terms:** transfer price

**Objective:** 6

**AACSB:** Analytical skills
Objective 22.7

1) Which of the following transfer-pricing methods always achieves goal congruence?
   A) a market-based transfer price  
   B) a cost-based transfer price  
   C) a negotiated transfer price  
   D) full-cost plus a standard profit margin  
   Answer: C  
   Diff: 2  
   Terms: transfer price, goal congruence  
   Objective: 7  
   AACSB: Reflective thinking

2) Which of the following transfer-pricing methods preserves sub-unit autonomy?
   A) market-based transfer pricing  
   B) cost-based transfer pricing  
   C) negotiated transfer pricing  
   D) Both A and C are correct.  
   Answer: D  
   Diff: 2  
   Terms: transfer price, autonomy  
   Objective: 7  
   AACSB: Reflective thinking

3) The minimum transfer price equals:
   A) opportunity costs less the additional outlay costs  
   B) opportunity costs times 125% plus the additional outlay costs  
   C) opportunity costs divided by the additional outlay costs  
   D) incremental costs plus opportunity costs  
   Answer: D  
   Diff: 1  
   Terms: transfer price  
   Objective: 7  
   AACSB: Reflective thinking

4) The seller of Product A has no idle capacity and can sell all it can produce at $60 per unit. Outlay cost is $12. What is the opportunity cost, assuming the seller sells internally?
   A) $12  
   B) $48  
   C) $60  
   D) $72  
   Answer: B  
   Explanation: B) $60 - $12 = $48  
   Diff: 2  
   Terms: transfer price  
   Objective: 7  
   AACSB: Analytical skills
5) The seller of a product has no idle capacity and can sell all it can produce at $33 per unit. Outlay cost is $9. What is the opportunity cost, assuming the seller sells internally?
A) $6
B) $12
C) $24
D) $33
Answer: C
Explanation: C) $33 - $9 = $24
Diff: 2
Terms: transfer price
Objective: 7
AACSB: Analytical skills

6) In analyzing transfer prices, the:
A) buyer will not willingly purchase a product for less than the incremental costs incurred to manufacture the product internally
B) seller will not willingly sell a product for less than the incremental costs incurred to make the product
C) buyer will willingly pay more than the ceiling transfer price
D) buyer will not pay less than the ceiling transfer price
Answer: B
Diff: 3
Terms: transfer price
Objective: 7
AACSB: Reflective thinking

7) Opportunity costs represent the cash flows directly associated with the production and transfer of the products and services.
Answer: FALSE
Explanation: Opportunity costs are the maximum contribution forgone by the selling division if the products or services are transferred internally.
Diff: 2
Terms: opportunity costs, transfer price
Objective: 7
AACSB: Reflective thinking

8) Market-based transfer prices are ideal when there is no idle capacity in the selling division.
Answer: TRUE
Diff: 2
Terms: transfer price, perfectly competitive market
Objective: 7
AACSB: Reflective thinking

9) If the product sold between divisions has no intermediate market, the opportunity cost of supplying the product internally is the variable cost of the product.
Answer: FALSE
Explanation: The opportunity cost of supplying the product internally is zero.
Diff: 2
Terms: transfer price
Objective: 7
AACSB: Reflective thinking
10) The Assembly Division of American Car Company has offered to purchase 90,000 batteries from the Electrical Division for $104 per unit. At a normal volume of 250,000 batteries per year, production costs per battery are as follows:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct materials</td>
<td>$ 40</td>
</tr>
<tr>
<td>Direct manufacturing labor</td>
<td>20</td>
</tr>
<tr>
<td>Variable factory overhead</td>
<td>12</td>
</tr>
<tr>
<td>Fixed factory overhead</td>
<td>40</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$112</strong></td>
</tr>
</tbody>
</table>

The Electrical Division has been selling 250,000 batteries per year to outside buyers at $136 each; capacity is 350,000 batteries per year. The Assembly Division has been buying batteries from outside sources for $130 each.

**Required:**

a. Should the Electrical Division manager accept the offer? Explain.

b. From the company's perspective, will the internal sales be of any benefit? Explain.

**Answer:**

a. Variable cost per battery = $40 + $20 + $12 = $72

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales to Assembly</td>
<td>$104</td>
</tr>
<tr>
<td>Variable costs</td>
<td>72</td>
</tr>
<tr>
<td><strong>Contribution margin</strong></td>
<td><strong>$ 32</strong></td>
</tr>
</tbody>
</table>

Because the Electrical Division is not at capacity, it should sell to the Assembly Division up to 100,000 units at $104. This will add $2,880,000 (90,000 × $32) at the current level to its operating income without reducing its outside sales.

b. The internal sales would be beneficial to the company because the internal variable manufacturing costs of $72 per battery are less than the external price of $130 currently being paid by the Assembly Division. The company would be saving $5,220,000 [90,000 × ($130 - $72)] per year.

**Diff:** 3

**Terms:** transfer price

**Objective:** 7

**AACSB:** Analytical skills
Objective 22.8

1) Soft Cushion Company is highly decentralized. Each division is empowered to make its own sales decisions. The Assembly Division can purchase stuffing, a key component, from the Production Division or from external suppliers. The Production Division has been the major supplier of stuffing in recent years. The Assembly Division has announced that two external suppliers will be used to purchase the stuffing at $20 per pound for the next year. The Production Division recently increased its unit price to $40. The manager of the Production Division presented the following information—variable cost $32 and fixed cost $8—to top management in order to attempt to force the Assembly Division to purchase the stuffing internally. The Assembly Division purchases 20,000 pounds of stuffing per month.

What would be the monthly operating advantage (disadvantage) of purchasing the goods internally, assuming the external supplier increased its price to $50 per pound and the Production Division is able to utilize the facilities for other operations, resulting in a monthly cash-operating savings of $30 per pound?

A) $1,000,000
B) $360,000
C) $(240,000)
D) $(400,000)

Answer: C

Explanation:

C) Purchase cost: (20,000 lbs. × $50) $1,000,000
Outlay cost: (20,000 lbs. × $32) (640,000)
Opportunity cost: (20,000 lbs. × $30) (600,000)
Advantage/(Disadvantage) $ (240,000)

Diff: 2
Terms: transfer price
Objective: 8
AACSB: Analytical skills

2) One of the problems in using one set of accounting records for tax reporting and another set of records for internal management reporting is:

A) it is illegal
B) tax authorities may suspect manipulation of records
C) it is almost impossible to keep the records straight and hard to reconcile the books
D) Both A and B are correct.

Answer: B

Diff: 1
Terms: transfer price
Objective: 8
AACSB: Reflective thinking
3) Section 482 of the U.S. Internal Revenue Code governing the taxation of multinational transfer pricing recognizes that transfer prices can be:
A) market based
B) negotiated
C) cost-plus based
D) Both A and C are correct.
Answer: D
Diff: 1
Terms: transfer price
Objective: 8
AACSB: Multiculturalism and diversity

4) A(n) ________ is a binding agreement between a multinational and the United States Internal Revenue Service to obtain approval for a specific transfer price for a number of years.
A) Tax Treaty
B) Advanced Pricing Agreement
C) Revenue Ruling
D) Dual Price Ruling
Answer: B
Diff: 2
Terms: transfer price
Objective: 8
AACSB: Multiculturalism and diversity

5) Global Giant, a multinational corporation, has a producing subsidiary in a low tax rate country and a marketing subsidiary in a high tax country. If Global Giant wants to minimize its worldwide tax liability, we would expect Global Giant to:
A) stop producing in the low tax rate country
B) stop marketing in the high tax rate country
C) establish a low transfer price when the producing unit sells to the marketing unit
D) establish a high transfer price when the producing unit sells to the marketing unit
Answer: D
Diff: 2
Terms: transfer price
Objective: 8
AACSB: Multiculturalism and diversity

6) Additional factors that arise in multinational transfer pricing include tariffs and customs duties levied on imports of products into a country.
Answer: TRUE
Diff: 2
Terms: transfer price
Objective: 8
AACSB: Multiculturalism and diversity
7) Tax considerations should play no part in determining a transfer price between international divisions of a firm.
Answer: FALSE
Explanation: Tax considerations should play an important part in determining a transfer price between international divisions of a firm.
Diff: 2
Terms: transfer price
Objective: 8
AACSB: Multiculturalism and diversity

8) It is possible to increase the overall after-tax profit of a multinational corporation by adjusting transfer prices.
Answer: TRUE
Diff: 2
Terms: decentralization
Objective: 8
AACSB: Multiculturalism and diversity

9) A company has a plant in a high tax jurisdiction that produces products for a facility in a low tax jurisdiction. Suggest a strategy, including transfer prices, which will result in the lowest tax for the overall corporation.
Answer: The overall corporate objective would be to report high costs and low revenue in the high tax jurisdiction, and low costs and high revenue in the low tax jurisdiction. In this situation, a low transfer price from the high tax jurisdiction facility will allocate more profit to the low tax jurisdiction. This will decrease total taxes paid by the corporation.
Diff: 2
Terms: transfer price
Objective: 8
AACSB: Reflective thinking

10) What is the role of unused capacity within the selling division in the determination of a negotiated transfer price to another division?
Answer: Unused capacity within the selling division affects the opportunity cost of an internal transfer. If there is unused capacity within a selling division, there are no opportunity costs involved in an internal transfer price situation. In this situation, the transfer price is likely to be in the lower range, covering only the outlay costs involved in the production of the product.
Diff: 2
Terms: transfer price
Objective: 8
AACSB: Reflective thinking
Objective 23.1

1) A report that measures financial and nonfinancial performance measures for various organization units in a single report is called a(n):
   A) balanced scorecard
   B) financial report scorecard
   C) imbalanced scorecard
   D) unbalanced scorecard
Answer: A
Diff: 1
Terms: Balanced Scorecard
Objective: 1
AACSB: Reflective thinking

2) Customer-satisfaction measures are an example of the:
   A) goal-congruence approach
   B) balanced scorecard approach
   C) financial report scorecard approach
   D) investment success approach
Answer: B
Diff: 1
Terms: Balanced Scorecard
Objective: 1
AACSB: Reflective thinking

3) An example of a performance measure with a long-run time horizon is:
   A) direct materials efficiency variances
   B) overhead spending variances
   C) number of new patents developed
   D) All of these answers are correct.
Answer: C
Diff: 2
Terms: Balanced Scorecard
Objective: 1
AACSB: Reflective thinking
4) Does operating income best measure a subunit's financial performance? This question is considered part of which step in designing an accounting-based performance measure?
   A) Choose performance measures that align with top management's financial goals.  
   B) Choose the time horizon of each performance measure.  
   C) Choose a definition for each performance measure.  
   D) Choose a measurement alternative for each performance measure.  
   Answer: A  
   Diff: 2  
   Terms: Balanced Scorecard  
   Objective: 1  
   AACSB: Reflective thinking

5) Should assets be defined as total assets or net assets? This question is considered part of which step in designing an accounting-based performance measure?
   A) Choose performance measures that align with top management's financial goals.  
   B) Choose the time horizon of each performance measure.  
   C) Choose a definition for each performance measure.  
   D) Choose a measurement alternative for each performance measure.  
   Answer: C  
   Diff: 2  
   Terms: return on investment (ROI)  
   Objective: 1  
   AACSB: Reflective thinking

6) Should assets be measured at historical cost or current cost? This question is considered part of which step in designing an accounting-based performance measure?
   A) Choose performance measures that align with top management's financial goals.  
   B) Choose the time horizon of each performance measure.  
   C) Choose a definition for each performance measure.  
   D) Choose a measurement alternative for each performance measure.  
   Answer: D  
   Diff: 2  
   Terms: current cost, return on investment (ROI)  
   Objective: 1  
   AACSB: Reflective thinking

7) Which of the following statements about designing an accounting-based performance measure is FALSE?
   A) The steps may be followed in a random order.  
   B) The issues considered in each step are independent.  
   C) Management's beliefs are present during the analyses.  
   D) Behavioral criteria are important when evaluating the steps.  
   Answer: B  
   Diff: 2  
   Terms: Balanced Scorecard  
   Objective: 1  
   AACSB: Reflective thinking
8) Many common performance measures, such as customer satisfaction, rely on internal financial accounting information.
Answer: FALSE
Explanation: Customer satisfaction would be obtained by surveys that are not in the financial accounting records.
Diff: 1
Terms: Balanced Scorecard
Objective: 1
AACSB: Analytical skills

9) Some companies present financial and nonfinancial performance measures for various organization units in a single report called the "balanced scorecard."
Answer: TRUE
Diff: 1
Terms: Balanced Scorecard
Objective: 1
AACSB: Analytical skills

10) The "balanced scorecard" in most organizations is broken down into the following categories: financial perspective, customer perspective, internal business-process perspective, and productivity perspective.
Answer: FALSE
Explanation: The "balanced scorecard" in most organizations is broken down into the following categories: financial perspective, customer perspective, internal business-process perspective, and learning-and-growth perspective.
Diff: 1
Terms: Balanced Scorecard
Objective: 1
AACSB: Reflective thinking

11) The first step in designing accounting based performance measures is to choose a target level of performance and feedback mechanism.
Answer: FALSE
Explanation: The first step in designing accounting based performance measures is to choose performance measures that align with top management's financial goals.
Diff: 1
Terms: performance measure
Objective: 1
AACSB: Reflective thinking
12) Assume you are evaluating a manufacturing company. Match the various organizational activities and concepts with the performance measures listed. Some items may have more than one match.

**Activities:**
1. Change in revenues
2. Cycle time
3. Economic order quantity
4. Manufacturing defects
5. Market share
6. New products
7. On-time delivery
8. Operating income
9. Product reliability
10. Time-to-market

**Performance measure:**

- a. Profitability
- b. Customer satisfaction
- c. Innovation
- d. Efficiency, quality, and time

**Answer:**
1, 8 a. Profitability
5, 7, 9 b. Customer satisfaction
6, 10 c. Innovation
2, 3, 4, 7, 9, 10 d. Efficiency, quality, and time

Diff: 2
Terms: Balanced Scorecard
Objective: 1
AACSB: Analytical skills
13) Designing an accounting based performance measure requires six steps. List each step. For three of the steps, describe a question that must be resolved as part of the implementation process.

Answer:
1. Choose performance measures that align with top management's goals.
   Does operating income, return on assets, or revenues best measure a subunit's financial goals?
2. Choose the time horizon of each performance measure.
   Should the performance measures be calculated for one year or a multiyear time horizon?
3. Choose a definition for each performance measure.
   Should assets be defined as total assets or net assets?
4. Choose a measurement alternative for each performance measure.
   Should assets be measured at historical cost or current cost?
5. Choose a target level of performance.
   Should all subunits have the same targets such as the same required rate of return on assets?
6. Choose the timing of the feedback.
   How often should manufacturing performance reports be sent to management?

Diff: 2
Terms: Balanced Scorecard
Objective: 1
AACSB: Reflective thinking

14) The executive vice president of Wicker Pen Company wants to establish an accounting-based performance measurement system for the company's new plant. The company has an accounting information system sufficient to support a fairly sophisticated performance measurement system. The new plant is going to be considered an investment center since its products will be markedly different from others the company currently sells. The new plant will have no internal dealings with other plants within the company.

Required:
What are some of the key steps that should be undertaken in the establishment of an accounting-based performance measurement system?

Answer: Key steps include:
1. Choose performance measures that align with top management's financial goals for the plant. They would include those that relate to the plant as an investment center.
2. Choose the time horizon of each performance measure in step 1.
3. Choose a definition of the components in each performance measure in step 1. For example, how should investment be defined?
4. Choose a measurement alternative for each performance measure in step 1. For example, should historical cost or current cost be used to measure investment?
5. Choose a target level of performance.
6. Choose the timing of feedback.

Diff: 2
Terms: Balanced Scorecard
Objective: 1
AACSB: Reflective thinking
15) Companies are increasingly using nonfinancial measures to evaluate performance. Why? Since these numbers do not come from the company's financial records, why are they used? 
Answer: The correct answer will revolve around the objective of providing quality goods to the corporation's customers. Quality goods bring repeat business and satisfied customers are a business' best advertisement.

The idea is that these nonfinancial measures concentrate on areas and questions that indicate the quality of a particular corporation's products. While some of these items do not come from a companies' financial records, such as defect rates, they are quantifiable and can be verified.

Diff: 3
Terms: Balanced Scorecard
Objective: 1
AACSB: Reflective thinking

Objective 23.2

1) Managers usually use the term return on investment to evaluate:
A) the performance of a subdivision  
B) a potential project  
C) the performance of a subunit  
D) Both A and C are correct.
Answer: D  
Diff: 2  
Terms: return on investment (ROI)  
Objective: 2  
AACSB: Reflective thinking

2) The return on investment is usually considered the most popular approach to incorporating the investment base into a performance measure because:
A) it blends all the ingredients of profitability into a single percentage  
B) once determined, there is no need to use it with other measures of performance  
C) it is similar to the company's price earnings ratio because a corporation's return on investment appears every day in The Wall Street Journal  
D) Both A and C are correct.
Answer: A  
Diff: 2  
Terms: return on investment (ROI)  
Objective: 2  
AACSB: Reflective thinking

3) Return on investment can be increased by:
A) increasing operating assets  
B) decreasing operating assets  
C) decreasing revenues  
D) Both B and C are correct.
Answer: B  
Diff: 2  
Terms: return on investment (ROI)  
Objective: 2  
AACSB: Reflective thinking
4) The _______ method of profitability analysis recognizes the two basic ingredients in profit-making: increasing income per dollar of revenues and using assets to generate more revenues.
   A) Balanced Scorecard  
   B) Residual-Income  
   C) Dupont  
   D) Economic Value Added  
   Answer: C  
   Diff: 2  
   Terms: return on investment (ROI)  
   Objective: 2  
   AACSB: Reflective thinking

5) During the past twelve months, the Aaron Corporation had a net income of $25,000. What is the amount of the investment if the return on investment is 20%?
   A) $50,000  
   B) $100,000  
   C) $125,000  
   D) $250,000  
   Answer: C  
   Explanation: C) 0.20 = $25,000/x; x = $125,000  
   Diff: 2  
   Terms: return on investment (ROI)  
   Objective: 2  
   AACSB: Analytical skills

6) During the past twelve months, the Zenith Corporation had a net income of $78,400. What is the return on investment if the amount of the investment is $560,000?
   A) 10%  
   B) 12%  
   C) 14%  
   D) 16%  
   Answer: C  
   Explanation: C) $78,400/$560,000 = 14%  
   Diff: 1  
   Terms: return on investment (ROI)  
   Objective: 2  
   AACSB: Analytical skills
7) The Alpha Beta Corporation had the following information for 20X5:

- Revenue $ 450,000
- Operating expenses 335,000
- Total assets 575,000

What is the return on investment?
A) 10%
B) 20%
C) 25%
D) 78.2%
Answer: B
Explanation: B) \((450,000 - $335,000)/575,000 = 20\%

Diff: 2
Terms: return on investment (ROI)
Objective: 2
AACSB: Analytical skills

8) Wacker Company has two regional offices. The data for each are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Maryland</th>
<th>New Jersey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$ 290,000</td>
<td>$ 298,000</td>
</tr>
<tr>
<td>Operating assets</td>
<td>2,400,000</td>
<td>4,500,000</td>
</tr>
<tr>
<td>Net operating income</td>
<td>1,008,000</td>
<td>1,200,000</td>
</tr>
</tbody>
</table>

What is the Maryland Division's return on investment?
A) 0.42
B) 0.54
C) 0.96
D) 4.12
Answer: A
Explanation: A) \$1,008,000/2,400,000 = 0.42

Diff: 1
Terms: return on investment (ROI)
Objective: 2
AACSB: Analytical skills
9) Thacker Company has two regional offices. The data for each are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Maryland</th>
<th>New Jersey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$290,000</td>
<td>$298,000</td>
</tr>
<tr>
<td>Operating assets</td>
<td>2,400,000</td>
<td>4,500,000</td>
</tr>
<tr>
<td>Net operating income</td>
<td>1,008,000</td>
<td>1,200,000</td>
</tr>
</tbody>
</table>

What is the return on investment for the New Jersey Division?
A) 0.21
B) 0.27
C) 0.48
D) 2.06
Answer: B
Explanation: B) \( \frac{1,200,000}{4,500,000} = 0.27 \)
Diff: 1
Terms: return on investment (ROI)
Objective: 2
AACSB: Analytical skills
Answer the following questions using the information below:

The Cybertronics Corporation reported the following information for its Cyclotron Division:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$2,000,000</td>
</tr>
<tr>
<td>Operating costs</td>
<td>1,200,000</td>
</tr>
<tr>
<td>Taxable income</td>
<td>400,000</td>
</tr>
<tr>
<td>Operating assets</td>
<td>1,000,000</td>
</tr>
</tbody>
</table>

Income is defined as operating income.

10) What is the Cyclotron Division's investment turnover ratio?
A) 2.00
B) 3.33
C) 2.50
D) 0.80
Answer:  A
Explanation:  A) $2,000,000/$1,000,000 = 2
Diff: 2
Terms:  return on investment (ROI)
Objective:  2
AACSB:  Analytical skills

11) What is the Cyclotron Division's return on sales?
A) 0.20
B) 0.40
C) 0.50
D) 0.60
Answer:  B
Explanation:  B) $2,000,000 - $1,200,000 = $800,000; $800,000/$2,000,000 = 0.40
Diff: 2
Terms:  return on investment (ROI)
Objective:  2
AACSB:  Analytical skills

12) What is the Cyclotron Division's return on investment?
A) 0.2
B) 0.4
C) 0.5
D) 0.8
Answer:  D
Explanation:  D) $800,000 / $1,000,000 = 0.8
Diff: 2
Terms:  return on investment (ROI)
Objective:  2
AACSB:  Analytical skills
The top management at Munchie Company, a manufacturer of computer games, is attempting to recover from a flood that destroyed some of their accounting records. The main computer system was also severely damaged. The following information was salvaged:

<table>
<thead>
<tr>
<th>Alpha Division</th>
<th>Beta Division</th>
<th>Gamma Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$5,000,000</td>
<td>(a) $2,300,000</td>
</tr>
<tr>
<td>Net operating income</td>
<td>$3,000,000</td>
<td>$1,300,000 $1,150,000</td>
</tr>
<tr>
<td>Operating assets</td>
<td>(b)</td>
<td>(c) $1,533,333</td>
</tr>
<tr>
<td>Return on investment</td>
<td>0.25</td>
<td>0.15 (d)</td>
</tr>
<tr>
<td>Return on sales</td>
<td>(e)</td>
<td>0.10 0.5</td>
</tr>
<tr>
<td>Investment turnover</td>
<td>(f)</td>
<td>(g) 1.5</td>
</tr>
</tbody>
</table>

13) What were the sales for the Beta Division?
A) $8,666,667
B) $11,904,760
C) $13,000,000
D) $14,303,600
Answer: C
Explanation: C) 0.10 = $1,300,000/x; x = $13,000,000
Diff: 2
Terms: return on investment (ROI)
Objective: 2
AACSB: Analytical skills

14) What is the value of the operating assets belonging to the Alpha Division?
A) $8,666,667
B) $12,000,000
C) $13,000,000
D) $14,303,600
Answer: B
Explanation: B) $3,000,000/0.25 = $12,000,000
Diff: 2
Terms: return on investment (ROI)
Objective: 2
AACSB: Analytical skills

15) What is the value of the operating assets belonging to the Beta Division?
A) $8,666,667
B) $11,904,760
C) $13,000,000
D) $14,303,600
Answer: A
Explanation: A) 0.15 = $1,300,000/x; x = $8,666,667
Diff: 2
Terms: return on investment (ROI)
Objective: 2
AACSB: Analytical skills
16) What is the Gamma Division's return on investment?
A) 0.25
B) 0.42
C) 0.60
D) 0.75
Answer: D
Explanation: D) $0.5 \times 1.5 = 0.75$
Diff: 2
Terms: return on investment (ROI)
Objective: 2
AACSB: Analytical skills

17) What is the Alpha Division's return on sales?
A) 0.25
B) 0.42
C) 0.60
D) 0.75
Answer: C
Explanation: C) $3,000,000 / $5,000,000 = 0.60$
Diff: 2
Terms: return on investment (ROI)
Objective: 2
AACSB: Analytical skills
Answer the following questions using the information below:

The top management at Groundsource Company, a manufacturer of lawn and garden equipment, is attempting to recover from a fire that destroyed some of their accounting records. The main computer system was also severely damaged. The following information was salvaged:

<table>
<thead>
<tr>
<th></th>
<th>Tractor Division</th>
<th>Tiller Division</th>
<th>Digger Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$10,000,000</td>
<td>(a)</td>
<td>$2,400,000</td>
</tr>
<tr>
<td>Net operating income</td>
<td>$1,000,000</td>
<td>$1,440,000</td>
<td>$600,000</td>
</tr>
<tr>
<td>Operating assets</td>
<td>(b)</td>
<td>(c)</td>
<td>(d)</td>
</tr>
<tr>
<td>Return on investment</td>
<td>0.20</td>
<td>0.10</td>
<td>(e)</td>
</tr>
<tr>
<td>Return on sales</td>
<td>(e)</td>
<td>0.12</td>
<td>0.25</td>
</tr>
<tr>
<td>Investment turnover</td>
<td>(f)</td>
<td>(g)</td>
<td>1.2</td>
</tr>
</tbody>
</table>

18) What were the sales for the Tiller Division?
   A) $9,600,000
   B) $12,000,000
   C) $15,000,000
   D) $15,500,000
   Answer:  B
   Explanation:  B) Return on Sales = Net Inc / Sales
                 S = $1,440,000 / .12 = $12,000,000
   Diff: 2
   Terms: return on investment (ROI)
   Objective: 2
   AACSB: Analytical skills

19) What is the value of the operating assets belonging to the Tractor Division?
   A) $3,500,000
   B) $4,000,000
   C) $4,500,000
   D) $5,000,000
   Answer:  D
   Explanation: D) ROI = Net Income / Assets
                 Assets = net Income / ROI
                 Assets = $1,000,000/0.20 = $5,000,000
   Diff: 2
   Terms: return on investment (ROI)
   Objective: 2
   AACSB: Analytical skills
20) What is the value of the operating assets belonging to the Tiller Division?
   A) $10,000,000
   B) $ 12,000,000
   C) $ 14,400,000
   D) $ 15,000,000
   Answer:  C
   Explanation:  C) ROI = Net Income / Assets
                Assets = Net Income / ROI
                Assets = $1,440,000/0.10 = $14,400,000
   Diff: 2
   Terms:  return on investment (ROI)
   Objective:  2
   AACSB:  Analytical skills

21) What is the Digger Division's return on investment?
   A) .25
   B) .30
   C) .45
   D) .60
   Answer:  B
   Explanation:  B) ROI = Net Income / Net Assets = Return on Sales x Asset Turnover
                0.25 \times 1.2 = .30
                Can Verify by dividing Net Income / Assets
                = $600,000 / $2,000,000 = .30
   Diff: 2
   Terms:  return on investment (ROI)
   Objective:  2
   AACSB:  Analytical skills

22) What is the Tractor Division's return on sales?
   A) 0.10
   B) 0.12
   C) 0.15
   D) 0.20
   Answer:  A
   Explanation:  A) $1,000,000/$10,000,000 = 0.10
   Diff: 2
   Terms:  return on investment (ROI)
   Objective:  2
   AACSB:  Analytical skills
23) What is the Tractor Division's investment turnover?
   A) .50
   B) 1.0
   C) 2.0
   D) 2.5
   Answer:  C
   Explanation:  C) Investment Turnover = Sales / Assets
   step 1 is to calculate the Assets
   ROI = Net Income / Assets
   Assets = net Income / ROI
   Assets = $1,000,000/0.20 = $5,000,000
   Then Investment Turnover = $10,000,000 / $5,000,000 = 2.0
   Diff: 2
   Terms:  return on investment (ROI)
   Objective:  2
   AACSB:  Analytical skills

24) What is the Tiller Division's investment turnover?
   A) .50
   B) .833
   C) 1.2
   D) 1.5
   Answer:  B
   Explanation:  B) Return on Investment = Return on Sales x Investment Turnover
   Investment Turnover = Return on Investment / Return on Sales
   = .10/.12 = .833
   Diff: 2
   Terms:  return on investment (ROI)
   Objective:  2
   AACSB:  Analytical skills

25) Costs recognized in particular situations that are NOT recognized by accrual accounting procedures are:
   A) opportunity costs
   B) imputed costs
   C) cash accounting costs
   D) None of these answers is correct.
   Answer:  B
   Diff: 1
   Terms:  imputed cost
   Objective:  2
   AACSB:  Reflective thinking
26) A problem with using residual income is that a corporation with a:
A) high investment turnover ratio always has a higher residual income than a corporation with a smaller investment turnover ratio
B) high return on sales always has a higher residual income than a corporation with a smaller return on sales
C) larger dollar amount of assets is likely to have a higher residual income than a corporation with a smaller dollar amount of assets
D) None of these answers is correct.
Answer: C
Diff: 2
Terms: residual income residual income (RI)
Objective: 2
AACSB: Reflective thinking

27) A company which favors the residual income approach wants managers to:
A) concentrate on maximizing an absolute amount of dollars
B) concentrate on maximizing a percentage return
C) maximize the investment turnover ratio
D) maximize return on sales
Answer: A
Diff: 2
Terms: residual income residual income (RI)
Objective: 2
AACSB: Reflective thinking

28) Using residual income as a measure of performance rather than return on investment promotes goal congruence because residual income:
A) places importance on the reduction of underperforming assets
B) calculates a percentage return rather than an absolute return
C) concentrates on maximizing an absolute amount of dollars
D) concentrates on maximizing the return on sales
Answer: C
Diff: 2
Terms: residual income residual income (RI)
Objective: 2
AACSB: Reflective thinking

29) Which of the following is the correct formula for return on sales?
A) Income / Investment
B) Investment / Income
C) Income / Revenue
D) Revenue / Investment
Answer: C
Diff: 1
Terms: return on investment
Objective: 2
AACSB: Reflective thinking
30) Another name for return on investment is the:
A) net present value
B) accounting rate of return
C) residual income
D) internal rate of return
Answer: B
Diff: 1
Terms: return on investment
Objective: 2
AACSB: Reflective thinking

Answer the following questions using the information below:

The Bandage Medical Supply Company has two divisions that operate independently of one another. The financial data for the year 2012 reported the following results:

<table>
<thead>
<tr>
<th></th>
<th>North</th>
<th>South</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$6,000,000</td>
<td>$5,000,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>1,500,000</td>
<td>1,100,000</td>
</tr>
<tr>
<td>Taxable income</td>
<td>1,300,000</td>
<td>750,000</td>
</tr>
<tr>
<td>Investment</td>
<td>12,000,000</td>
<td>10,000,000</td>
</tr>
</tbody>
</table>

The company's desired rate of return is 10%. Income is defined as operating income.

31) What are the respective return-on-investment ratios for the North and South Divisions?
A) 0.110 and 0.125
B) 0.108 and 0.075
C) 0.125 and 0.110
D) 0.125 and 0.150
Answer: C
Explanation: C) North = $1,500,000/$12,000,000 = 0.125
South = $1,100,000/$10,000,000 = 0.110
Diff: 2
Terms: return on investment (ROI)
Objective: 2
AACSB: Analytical skills

32) What are the respective residual incomes for the North and South Divisions?
A) $60,000 and $100,000
B) $300,000 and $60,000
C) $300,000 and $100,000
D) $100,000 and a negative $300,000
Answer: C
Explanation: C) North = $1,500,000 - (0.1 × $12,000,000) = $300,000
South = $1,100,000 - (0.1 × $10,000,000) = $100,000
Diff: 2
Terms: residual income residual income (RI)
Objective: 2
AACSB: Analytical skills
33) Which division has the best return on investment and which division has the best residual income figure, respectively?
A) North, North
B) South, South
C) North, South
D) South, North
Answer: A
Explanation: A) North = $1,500,000/$12,000,000 = 0.125
South = $1,100,000/$10,000,000 = 0.110
North = $1,500,000 - (0.1 × $12,000,000) = $300,000
South = $1,100,000 - (0.1 × $10,000,000) = $100,000
Diff: 2
Terms: return on investment (ROI), residual income (RI)
Objective: 2
AACSB: Analytical skills

34) After-tax operating income minus the after-tax weighted-average cost of capital multiplied by total assets minus current liabilities equals:
A) return on investment
B) residual income
C) economic value added
D) weighted-average cost of capital
Answer: C
Diff: 1
Terms: economic value added (EVA®)
Objective: 2
AACSB: Reflective thinking

35) The after-tax average cost of all the long-term funds used by a corporation equals:
A) economic value added
B) return on investment
C) return on equity
D) weighted-average cost of capital
Answer: D
Diff: 1
Terms: economic value added (EVA®)
Objective: 2
AACSB: Reflective thinking
36) A negative feature of defining investment by EXCLUDING the portion of total assets employed that are financed by short-term creditors is that:
A) current liabilities are sometimes difficult to define
B) short-term debt is always more expensive to finance than long-term debt
C) this method encourages managers to use an excessive amount of short-term debt
D) this method encourages managers to use an excessive amount of long-term debt
Answer: C
Diff: 2
Terms: economic value added (EVA®), investment
Objective: 2
AACSB: Reflective thinking

37) Springfield Corporation, whose tax rate is 40%, has two sources of funds: long-term debt with a market value of $8,000,000 and an interest rate of 8%, and equity capital with a market value of $12,000,000 and a cost of equity of 12%. What is Springfield's weighted average cost of capital (WACC)?
A) .0480
B) .0800
C) .0912
D) .1000
Answer: C
Explanation: C) \[\frac{(.08)(.6) + (.12)(.4)}{8,000,000 + 12,000,000} = .0912\]
Diff: 2
Terms: economic value added (EVA®)
Objective: 2
AACSB: Analytical skills

38) Springfield Corporation, whose tax rate is 40%, has two sources of funds: long-term debt with a market value of $8,000,000 and an interest rate of 8%, and equity capital with a market value of $12,000,000 and a cost of equity of 12%. Springfield has two operating divisions, the Blue division and the Gold division, with the following financial measures for the current year:

<table>
<thead>
<tr>
<th></th>
<th>Total Assets</th>
<th>Current Liabilities</th>
<th>Operating Income</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Blue Div.</strong></td>
<td>$9,500,000</td>
<td>$2,800,000</td>
<td>$1,055,000</td>
</tr>
<tr>
<td><strong>Gold Div.</strong></td>
<td>$11,000,000</td>
<td>$2,200,000</td>
<td>$1,200,000</td>
</tr>
</tbody>
</table>

What is Economic Value Added (EVA®) for the Blue Division?
A) -$233,400
B) $21,960
C) $188,600
D) $433,960
Answer: B
Explanation: B) \[\text{WACC} = \frac{(.08)(.6) + (.12)(.4)}{8,000,000 + 12,000,000} = .0912\]
\[\text{EVA} = (1.055,000 - .4) - ((9,500,000 - 2,800,000) \times .0912) = 21,960\]
Diff: 3
Terms: economic value added (EVA®)
Objective: 2
AACSB: Analytical skills
39) Springfield Corporation, whose tax rate is 40%, has two sources of funds: long-term debt with a market value of $8,000,000 and an interest rate of 8%, and equity capital with a market value of $12,000,000 and a cost of equity of 12%. Springfield's after-tax cost of debt is:
A) .0320  
B) .0480  
C) .0800  
D) .0912  
Answer: B  
Explanation: B) .08 × (1 - .4) = .048  
Diff: 2  
Terms: economic value added (EVA®)  
Objective: 2  
AACSB: Analytical skills

40) Springfield Corporation, whose tax rate is 40%, has two sources of funds: long-term debt with a market value of $8,000,000 and an interest rate of 8%, and equity capital with a market value of $12,000,000 and a cost of equity of 12%. Springfield has two operating divisions, the Blue division and the Gold division, with the following financial measures for the current year:

<table>
<thead>
<tr>
<th></th>
<th>Total Assets</th>
<th>Current Liabilities</th>
<th>Operating Income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue Div.</td>
<td>$9,500,000</td>
<td>$2,800,000</td>
<td>$1,055,000</td>
</tr>
<tr>
<td>Gold Div.</td>
<td>$11,000,000</td>
<td>$2,200,000</td>
<td>$1,200,000</td>
</tr>
</tbody>
</table>

Calculate EVA® for the Gold Division.
A) ($283,200)  
B) ($82,560)  
C) $196,800  
D) $397,440  
Answer: B  
Explanation: B) WACC = [($8,000,000 × (1 - .4) × (.08)) + ($12,000,000 × .12)] / ($8,000,000 + $12,000,000) = .0912  
EVA® = ($1,200,000 × (1 - .4)) - (($11,000,000 - $2,200,000) × .0912) = ($82,560)  
Diff: 3  
Terms: economic value added (EVA®)  
Objective: 2  
AACSB: Analytical skills
Answer the following questions using the information below:

Waldorf Company has two sources of funds: long-term debt with a market and book value of $5 million issued at an interest rate of 12%, and equity capital that has a market value of $4 million (book value of $2 million). Waldorf Company has profit centers in the following locations with the following operating incomes, total assets, and current liabilities. The cost of equity capital is 12%, while the tax rate is 25%.

<table>
<thead>
<tr>
<th>Operating Income</th>
<th>Assets</th>
<th>Current Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>St. Louis</td>
<td>$ 480,000</td>
<td>$ 2,000,000</td>
</tr>
<tr>
<td>Cedar Rapids</td>
<td>$600,000</td>
<td>$ 4,000,000</td>
</tr>
<tr>
<td>Wichita</td>
<td>$1,020,000</td>
<td>$6,000,000</td>
</tr>
</tbody>
</table>

41) What is the EVA® for St. Louis?
   A) $127,870
   B) $163,730
   C) $196,270
   D) $360,000

   Answer: B
   Explanation: B) WACC = [(0.12 × (1 - 0.25) × $5,000,000) + (0.12 × $4,000,000)]/$9,000,000 = 0.1033
              St. Louis (EVA®) = ($480,000 × (1 - 0.25)) - [0.1033 × ($2,000,000 - $100,000)] = $360,000 - $196,270 = $163,730
   Diff: 3
   Terms: economic value added (EVA®)
   Objective: 2
   AACSB: Analytical skills

42) What is the EVA® for Cedar Rapids?
   A) $67,790
   B) $110,000
   C) $117,000
   D) $152,500

   Answer: A
   Explanation: A) Cedar Rapids (EVA®) = ($600,000 × (1 - 0.25)) - [0.1033 × ($4,000,000 - $300,000)]
                 = $450,000 - $382,210 = $67,790
   Diff: 3
   Terms: economic value added (EVA®)
   Objective: 2
   AACSB: Analytical skills
43) What is the EVA® for Wichita?
A) $225,000  
B) $765,000  
C) $207,180  
D) $557,820  
Answer: C  
Explanation: C) Wichita (EVA®) = ($1,020,000 × .75) - [(0.1033 × ($6,000,000 - $600,000))] = $765,000 - $557,820 = 207,180  
Diff: 3  
Terms: economic value added (EVA®)  
Objective: 2  
AACSB: Analytical skills

Answer the following questions using the information below:

Coldbrook Company has two sources of funds: long-term debt with a market and book value of $15 million issued at an interest rate of 10%, and equity capital that has a market value of $9 million (book value of $5 million). Coldbrook Company has profit centers in the following locations with the following operating incomes, total assets, and current liabilities. The cost of equity capital is 15%, while the tax rate is 30%.

<table>
<thead>
<tr>
<th>Location</th>
<th>Operating Income</th>
<th>Assets</th>
<th>Current Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bish Bash Falls</td>
<td>$815,000</td>
<td>$3,750,000</td>
<td>$800,000</td>
</tr>
<tr>
<td>Brooksville</td>
<td>$1,100,000</td>
<td>$5,000,000</td>
<td>$1,200,000</td>
</tr>
<tr>
<td>Stonybrook</td>
<td>$2,450,000</td>
<td>$9,250,000</td>
<td>$3,180,000</td>
</tr>
</tbody>
</table>

44) What is the EVA® for Bish Bash Falls?
A) $338,563  
B) $305,000  
C) $275,500  
D) $255,500  
Answer: C  
Explanation: C) WACC = [(.10 × (1 - .30) × $15,000,000) + (0.15 × $9,000,000)]/$24,000,000 = 0.100  
Bish Bash Falls (EVA®) = ($815,000 × (1 - .30)) - [0.100 × ($3,750,000 - $800,000)] = $570,500 - $295,000 = $275,500  
Diff: 3  
Terms: economic value added (EVA®)  
Objective: 2  
AACSB: Analytical skills
45) What is the EVA® for Brooksville?
A) $476,250  
B) $428,000  
C) $415,525  
D) $390,000  
Answer:  D  
Explanation:  D) \[ \text{WACC} = \frac{(.10 \times (1 - .30) \times $15,000,000) + (0.15 \times $9,000,000)}{$24,000,000} = 0.100 \]  
Brooksville (EVA®) = \[ ($1,100,000 \times (1 - .30)) - [0.100 \times ($5,000,000 - $1,200,000)] = $770,000 - $380,000 = $390,000 \]  
Diff: 3  
Terms:  economic value added (EVA®)  
Objective:  2  
AACSB:  Analytical skills

46) What is the EVA® for Stonybrook?
A) $1,108,000  
B) $1,168,700  
C) $1,315,063  
D) $1,403,063  
Answer:  A  
Explanation:  A) \[ \text{WACC} = \frac{(.10 \times (1 - .30) \times $15,000,000) + (0.15 \times $9,000,000)}{$24,000,000} = 0.100 \]  
Stonybrook (EVA®) = \[ ($2,450,000 \times (1 - .30)) - [0.100 \times ($9,250,000 - $3,180,000)] = $1,715,000 - $607,000 = $1,108,000 \]  
Diff: 3  
Terms:  economic value added (EVA®)  
Objective:  2  
AACSB:  Analytical skills

47) A major weakness of comparing two companies using only operating incomes as the basis of comparison is this method ignores differences in the size of the investment required to earn the operating income.
Answer:  TRUE  
Diff: 1  
Terms:  return on investment (ROI), investment  
Objective:  2  
AACSB:  Analytical skills

48) Return on investment is also called the accrual accounting rate of return.
Answer:  TRUE  
Diff: 1  
Terms:  return on investment (ROI)  
Objective:  2  
AACSB:  Reflective thinking
49) Return on sales is calculated by dividing revenues by income.
Answer: FALSE
Explanation: Return on sales is calculated as income divided by revenues.
Diff: 1
Terms: return on investment (ROI)
Objective: 2
AACSB: Reflective thinking

50) Investment turnover is calculated as revenue divided by investment.
Answer: TRUE
Diff: 1
Terms: return on investment (ROI)
Objective: 2
AACSB: Reflective thinking

51) The three alternatives for increasing return on investment include increasing assets such as receivables, increasing revenues, and decreasing costs. (In all cases assume that all other items stay the same.)
Answer: FALSE
Explanation: Increasing receivables does not increase return on investment.
Diff: 2
Terms: return on investment (ROI)
Objective: 2
AACSB: Reflective thinking

52) The residual income method is the most popular performance measure when measuring performance in an investment center.
Answer: FALSE
Explanation: Return on investment is the most popular performance measure when measuring performance in an investment center.
Diff: 1
Terms: return on investment (ROI), residual income, residual income (RI)
Objective: 2
AACSB: Analytical skills

53) To evaluate overall aggregate performance, return on investment and residual income measures are more appropriate than return on sales.
Answer: TRUE
Diff: 2
Terms: return on investment (ROI), residual income, residual income (RI)
Objective: 2
AACSB: Analytical skills

54) Required rate of return multiplied by the investment is the imputed cost of the investment.
Answer: TRUE
Explanation: Required rate of return multiplied by the investment is the imputed cost of the investment.
Diff: 1
Terms: imputed cost
Objective: 2
AACSB: Reflective thinking
55) Imputed costs are costs recognized in particular situations that are NOT usually recognized by accrual accounting procedures.
Answer: TRUE
Diff: 2
Terms: imputed cost
Objective: 2
AACSB: Reflective thinking

56) The objective of maximizing return on investment may induce managers of highly profitable divisions to reject projects that from the viewpoint of the overall organization should be accepted.
Answer: TRUE
Diff: 2
Terms: return on investment (ROI)
Objective: 2
AACSB: Analytical skills

57) Goal congruence is more likely to be promoted by using return on investment rather than residual income as a measure of a subunit's managerial performance.
Answer: FALSE
Explanation: Goal congruence is more likely to be promoted by using residual income rather than return on investment.
Diff: 2
Terms: return on investment (ROI), residual income residual income (RI)
Objective: 2
AACSB: Analytical skills

58) Economic value added, unlike residual income, charges managers for the costs of their investments in long-term assets and working capital.
Answer: FALSE
Explanation: Both economic value added and residual income charge managers for the costs of their investments in long-term capital.
Diff: 2
Terms: economic value added (EVA®), residual income (RI)
Objective: 2
AACSB: Reflective thinking

59) Companies that adopt the Economic Value Added concept define investment as total assets employed minus current liabilities.
Answer: TRUE
Diff: 2
Terms: economic value added (EVA®)
Objective: 2
AACSB: Reflective thinking
60) In an Economic Added Value calculation, the corporate charge for a division's investment is based on a weighted average of the after-tax interest rate on the firm's debt and the cost of the firm's equity.
Answer: TRUE
Explanation: In an Economic Added Value calculation, the corporate charge for a division's investment is based on a weighted average of the after-tax interest rate on the firm's debt and the cost of the firm's equity.
Diff: 2
Terms: economic value added (EVA®)
Objective: 2
AACSB: Reflective thinking

61) In an Economic Value Added calculation, the measure of the invested capital for a division would be that division's assets minus that division's liabilities.
Answer: FALSE
Explanation: In an Economic Value Added calculation, the measure of the invested capital for a division would be that division's assets minus that division's current liabilities.
Diff: 2
Terms: economic value added (EVA®)
Objective: 2
AACSB: Reflective thinking

62) In an Economic Value Added calculation, the appropriate measure of a division's profit would be that division's pre-tax operating income.
Answer: FALSE
Explanation: In an Economic Value Added calculation, the appropriate measure of a division's profit would be that division's after tax operating income.
Diff: 2
Terms: economic value added (EVA®)
Objective: 2
AACSB: Reflective thinking
63) Museum Corporation uses the investment center concept for the museums that it manages. Select operating data for three of its museums for 2012 are as follows:

<table>
<thead>
<tr>
<th></th>
<th>St. Louis</th>
<th>Dallas</th>
<th>Miami</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>$1,200,000</td>
<td>$1,500,000</td>
<td>$1,800,000</td>
</tr>
<tr>
<td>Operating assets</td>
<td>600,000</td>
<td>500,000</td>
<td>700,000</td>
</tr>
<tr>
<td>Net operating income</td>
<td>102,000</td>
<td>112,000</td>
<td>118,000</td>
</tr>
</tbody>
</table>

**Required:**
a. Compute the return on investment for each division.
b. Which museum manager is doing best based only on ROI? Why?
c. What other factors should be included when evaluating the managers?

**Answer:**
a. St. Louis = $102,000/$600,000 = 0.170
   Dallas = $112,000/$500,000 = 0.224
   Miami = $118,000/$700,000 = 0.169

b. Dallas was doing the best because the ROI was the highest, and compared to Miami, was doing better with fewer assets.

c. At a minimum, the company should consider examining the DuPont method, residual income, and the age of operating assets.

**Diff:** 2

**Terms:** return on investment (ROI), residual income (RI)

**Objective:** 2

**AACSB:** Analytical skills
Consolidated Gas Supply Corporation uses the investment center concept for the gasoline stations that it manages in the city. Consolidated has a 15% required rate of return on investment in order for a branch station to be viable. Select operating data for three of its stations for 200X are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Maple Street</th>
<th>Oak Street</th>
<th>Hickory Street</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>$17,000,000</td>
<td>$13,500,000</td>
<td>$15,000,000</td>
</tr>
<tr>
<td>Operating assets</td>
<td>7,000,000</td>
<td>7,000,000</td>
<td>5,000,000</td>
</tr>
<tr>
<td>Net operating income</td>
<td>960,000</td>
<td>1,150,000</td>
<td>910,000</td>
</tr>
</tbody>
</table>

Required:

a. Compute the return on investment for each station.
b. Which station manager is doing best based only on ROI? Why?
c. Are any of the stations in danger of being closed due to lack of performance?
d. What other factors should be included when evaluating the managers?

Answer:

a. Maple \( = \frac{960,000}{7,000,000} \approx 0.137 \)
   Oak \( = \frac{1,150,000}{7,000,000} \approx 0.164 \)
   Hickory \( = \frac{910,000}{5,000,000} \approx 0.182 \)

b. Hickory Street was doing the best because the ROI was the highest.

c. Maple Street is in danger of being shut down because it is only making a return on its investment base of 13.7%. This is less than the required rate of return of 15%.

d. At a minimum, the company should consider examining the DuPont method, residual income, and the age of operating assets.

Diff: 2
Terms: return on investment (ROI), residual income residual income (RI)
Objective: 2
AACSB: Analytical skills
65) Kase Tractor Company allows its divisions to operate as autonomous units. The operating data for 20X5 follow:

<table>
<thead>
<tr>
<th></th>
<th>Plows</th>
<th>Tractors</th>
<th>Combines</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revenues</td>
<td>$2,250,000</td>
<td>$500,000</td>
<td>$4,800,000</td>
</tr>
<tr>
<td>Accounts receivable</td>
<td>800,000</td>
<td>152,500</td>
<td>1,435,000</td>
</tr>
<tr>
<td>Operating assets</td>
<td>1,000,000</td>
<td>400,000</td>
<td>1,750,000</td>
</tr>
<tr>
<td>Net operating income</td>
<td>220,000</td>
<td>60,000</td>
<td>480,000</td>
</tr>
<tr>
<td>Taxable income</td>
<td>165,000</td>
<td>90,000</td>
<td>385,000</td>
</tr>
</tbody>
</table>

Required:

a. Compute the investment turnover for each division.

b. Compute the return on sales for each division.

c. Compute the return on investment for each division.

d. Which division manager is doing best? Why?

e. What other factors should be included when evaluating the managers?

For parts (b) and (c) income is defined as operating income.

Answer:

a. **Investment turnover**:

   - Plows = $2,250,000/$1,000,000 = 2.25
   - Tractors = $500,000/$400,000 = 1.25
   - Combines = $4,800,000/$1,750,000 = 2.74

b. **Return on Sales**:

   - Plows = $220,000/$2,250,000 = 0.10
   - Tractors = $60,000/$500,000 = 0.12
   - Combines = $480,000/$4,800,000 = 0.10

c. **ROI**:

   - Plows = 2.25 × 0.10 = 0.225
   - Tractors = 1.25 × 0.12 = 0.150
   - Combines = 2.74 × 0.10 = 0.274

d. Combines' manager had the best performance because he had the highest investment turnover, which offset his second-best return on sales.

e. Residual income should be considered and noncontrollable factors such as the age of the assets.

Diff: 2

Terms: return on investment (ROI)

Objective: 2

AACSB: Analytical skills
66) Provide the missing data for the following situations:

<table>
<thead>
<tr>
<th></th>
<th>Red Division</th>
<th>White Division</th>
<th>Blue Division</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$?</td>
<td>$10,000,000</td>
<td>$?</td>
</tr>
<tr>
<td>Net operating income</td>
<td>$200,000</td>
<td>$400,000</td>
<td>$288,000</td>
</tr>
<tr>
<td>Operating assets</td>
<td>$?</td>
<td>$?</td>
<td>$1,600,000</td>
</tr>
<tr>
<td>Return on investment</td>
<td>0.16</td>
<td>0.10</td>
<td>?</td>
</tr>
<tr>
<td>Return on sales</td>
<td>0.04</td>
<td>?</td>
<td>0.12</td>
</tr>
<tr>
<td>Investment turnover</td>
<td>?</td>
<td>?</td>
<td>1.5</td>
</tr>
</tbody>
</table>

Answer:

**Red Division:**

ROI = ROS × IT

0.16 = 0.04 × IT

IT = 4.0

ROS = Income/Sales

0.04 = $200,000/Sales

Sales = $5,000,000

IT = Sales/OA

4 = $5,000,000/OA

OA = $1,250,000

**White Division:**

ROS = $400,000/$10,000,000 = 0.04

IT = ROI/ROS = 0.10/0.04 = 2.5

OA = S/IT = $10,000,000/2.5 = $4,000,000

**Blue Division:**

Sales = IT × OA = 1.5 × $1,600,000 = $2,400,000

ROI = 0.12 × 1.5 = 0.18

Diff: 3

Terms: return on investment (ROI)

Objective: 2

AACSB: Analytical skills
67) Hargrave Products has three divisions, which operate autonomously. Their results for 20X5 were as follows:

<table>
<thead>
<tr>
<th></th>
<th>East</th>
<th>West</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$30,000,000</td>
<td>$40,000,000</td>
<td>$50,000,000</td>
</tr>
<tr>
<td>Cost of goods sold</td>
<td>15,000,000</td>
<td>25,000,000</td>
<td>37,000,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>4,500,000</td>
<td>4,750,000</td>
<td>5,000,000</td>
</tr>
<tr>
<td>Investment base</td>
<td>30,000,000</td>
<td>30,500,000</td>
<td>31,000,000</td>
</tr>
</tbody>
</table>

The company's desired rate of return is 15%.

**Required:**

a. Compute each division's ROI. Round to three decimal places.
b. Compute each division's residual income.

**Answer:**

a. East ROI = $4,500,000/$30,000,000 = 0.150
   West ROI = $4,750,000/$30,500,000 = 0.156
   International = $5,000,000/$31,000,000 = 0.161

b.

<table>
<thead>
<tr>
<th></th>
<th>East</th>
<th>West</th>
<th>International</th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment base</td>
<td>$30,000,000</td>
<td>$30,500,000</td>
<td>$31,000,000</td>
</tr>
<tr>
<td>Minimum rate</td>
<td>× 0.15</td>
<td>× 0.15</td>
<td>× 0.15</td>
</tr>
<tr>
<td>Minimum return</td>
<td>$4,500,000</td>
<td>$4,575,000</td>
<td>$4,650,000</td>
</tr>
<tr>
<td>Operating Income</td>
<td>$4,500,000</td>
<td>$4,750,000</td>
<td>$5,000,000</td>
</tr>
<tr>
<td>Minimum return</td>
<td>4,500,000</td>
<td>4,575,000</td>
<td>4,650,000</td>
</tr>
<tr>
<td>Residual income</td>
<td>$0</td>
<td>$175,000</td>
<td>$350,000</td>
</tr>
</tbody>
</table>

**Diff: 2**
Terms: return on investment (ROI), residual income residual income (RI)
Objective: 2
AACSB: Analytical skills
68) Batman Abstract Company has three divisions that operate autonomously. Their results for 20X5 are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Riddler</th>
<th>Joker</th>
<th>Penguin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
<td>$5,000,000</td>
<td>$7,000,000</td>
<td>$10,000,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>1,440,000</td>
<td>1,700,000</td>
<td>3,500,000</td>
</tr>
<tr>
<td>Operating income</td>
<td>1,000,000</td>
<td>1,750,000</td>
<td>2,520,000</td>
</tr>
<tr>
<td>Investment base</td>
<td>9,000,000</td>
<td>10,000,000</td>
<td>14,000,000</td>
</tr>
</tbody>
</table>

The company's desired rate of return is 20%.

**Required:**

a. Compute each division's ROI.

b. Compute each division's residual income.

c. Rank each division by both ROI and residual income.

d. Which division had the best performance in 20X5? Why?

**Answer:**

a. Riddler ROI = $1,000,000/$9,000,000 = 0.111
Joker ROI = $1,750,000/$10,000,000 = 0.175
Penguin ROI = $2,520,000/$14,000,000 = 0.180

b. |             | Riddler     | Joker       | Penguin     |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Investment base</td>
<td>$9,000,000</td>
<td>$10,000,000</td>
<td>$14,000,000</td>
</tr>
<tr>
<td>Minimum rate</td>
<td>× 0.20</td>
<td>× 0.20</td>
<td>× 0.20</td>
</tr>
<tr>
<td>Minimum return</td>
<td>$1,800,000</td>
<td>$2,000,000</td>
<td>$2,800,000</td>
</tr>
<tr>
<td>Income</td>
<td>$1,000,000</td>
<td>$1,750,000</td>
<td>$2,520,000</td>
</tr>
<tr>
<td>Minimum return</td>
<td>1,800,000</td>
<td>2,000,000</td>
<td>2,800,000</td>
</tr>
<tr>
<td>Residual income</td>
<td>$(800,000)</td>
<td>$(250,000)</td>
<td>$(280,000)</td>
</tr>
</tbody>
</table>

c. **ROI Rank:**
Penguin # 1
Joker # 2
Riddler # 3

**RI Rank:**
Joker # 1
Penguin # 2
Riddler # 3

d. As to which division was the best, it is difficult to determine without knowing what the results are being used to evaluate. If management is measuring only the return of capital, the Penguin Division has the highest ranking, although not much ahead of Joker. However, Penguin does have a substantially higher income level. As to meeting management's expectations of residual income, all divisions fall short of the goal with Joker being slightly ahead of Penguin.

Diff: 3
Terms: return on investment (ROI), residual income (RI)
Objective: 2
AACSB: Analytical skills
Coptermagic Company supplies helicopters to corporate clients. Coptermagic has two sources of funds: long term debt with a market and book value of $32 million issued at an interest rate of 10%, and equity capital that has a market value of $18 million (book value of $8 million). The cost of equity capital for Coptermagic is 15%, and its tax rate is 30%. Coptermagic has profit centers in four divisions that operate autonomously. The company's results for 2008 are as follows:

<table>
<thead>
<tr>
<th>Division</th>
<th>Operating Income</th>
<th>Assets</th>
<th>Current Liabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>$1,750,000</td>
<td>$11,500,000</td>
<td>$2,500,000</td>
</tr>
<tr>
<td>Chicago</td>
<td>2,400,000</td>
<td>9,000,000</td>
<td>3,500,000</td>
</tr>
<tr>
<td>Dallas</td>
<td>4,675,000</td>
<td>27,500,000</td>
<td>9,500,000</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>4,200,000</td>
<td>25,000,000</td>
<td>8,000,000</td>
</tr>
</tbody>
</table>

**Required:**

a. Compute Coptermagic's weighted average cost of capital.
b. Compute each division's Economic Value Added.
c. Rank the divisions by EVA.

**Answer:**
a. \[
\text{WACC} = \left[\left(0.10 \times (1 - 0.30) \times 32,000,000\right) + (0.15 \times 18,000,000)\right] / 50,000,000 = 9.88\% 
\]
b. New York (EVA) = \[
\left(1,750,000 \times (1 - 0.30)\right) - [0.0988 \times (11,500,000 - 2,500,000)] = 335,800
\]
Chicago (EVA) = \[
\left(2,400,000 \times (1 - 0.30)\right) - [0.0988 \times (9,000,000 - 3,500,000)] = 1,136,600
\]
Dallas (EVA) = \[
\left(4,675,000 \times (1 - 0.30)\right) - [0.0988 \times (27,500,000 - 9,500,000)] = 1,494,100
\]
Los Angeles (EVA) = \[
\left(4,200,000 \times (1 - 0.30)\right) - [0.0988 \times (25,000,000 - 8,000,000)] = 1,260,400
\]
c. **Rank:**
   - Dallas # 1
   - Los Angeles # 2
   - Chicago # 3
   - New York #4

**Diff:** 3
Terms: economic value added (EVA®)
Objective: 2
AACSB: Analytical skills
70) Bob's Cellular Phone Company uses ROI to measure divisional performance. Annual ROI calculations for each division have traditionally employed the ending amount of invested capital along with annual operating income and net revenue. The Dupont method is generally used. The company's Phone Accessories Division had the following results for the last two years:

\[
\begin{align*}
20X5 \text{ ROI} & = \frac{\$2,000,000}{\$20,000,000} \times \frac{\$20,000,000}{\$10,000,000} = 0.20 \\
20X6 \text{ ROI} & = \frac{\$2,400,000}{\$25,000,000} \times \frac{\$25,000,000}{\$15,000,000} = 0.16 \\
\end{align*}
\]

Corporate management was disappointed in the performance of the division for 20X6, since it had made an additional investment in the division that was budgeted for a 23% ROI.

**Required:**

a. Discuss some factors that may have contributed to the decrease in ROI for 20X6.

b. Would there have been any substantial difference if average capital had been used?

**Answer:**

a. While sales increased by 25%, net income only increased by 20%. This may indicate that expenses increased more than they should have. Apparently, the expected marginal net income from the new investment was $1,150,000 ($5,000,000 \times 0.23), and either sales were too low or expenses too high for the new products. But this calculation is somewhat hypothetical since we do not know expected sales. Start-up costs may have also contributed to the increased expenses of the first year's operations. An increase in investment also contributed to the decline in return on investment.

b. Using average capital: 

\[
\text{ROI} = \frac{\$2,400,000}{\$12,500,000} = 0.192
\]

Using average capital would have improved the ROI from 16% to over 19%. This would still have been a disappointment to management because the total ROI fell below expectations. Perhaps it is unreasonable to expect a new investment to achieve its target ROI in the first year of operations.

Diff: 3
Terms: return on investment (ROI)
Objective: 2
AACSB: Analytical skills

71) The economic value added concept has attracted considerable attention in recent years. Explain the attractiveness of this number as a measure of performance.

**Answer:** The attractiveness of economic value added at the divisional level is primarily the fact that it allows managers to incorporate the cost of capital in decisions at the divisional level.

Diff: 3
Terms: economic value added (EVA®)
Objective: 2
AACSB: Reflective thinking
Ruth Cleaning Products manufactures home cleaning products. The company has two divisions, Bleach and Cleanser. Because of different accounting methods and inflation rates, the company is considering multiple evaluation measures. The following information is provided for 20X5:

<table>
<thead>
<tr>
<th></th>
<th>ASSETS</th>
<th>INCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Book value</td>
<td>Current value</td>
</tr>
<tr>
<td>Bleach</td>
<td>$225,000</td>
<td>$300,000</td>
</tr>
<tr>
<td>Cleanser</td>
<td>$450,000</td>
<td>$250,000</td>
</tr>
</tbody>
</table>

The company is currently using a 15% required rate of return.

1) What are Bleach's and Cleanser's return on investment based on book values, respectively?
   A) 0.22; 0.67  
   B) 0.42; 0.52  
   C) 0.52; 0.42  
   D) 0.67; 0.22
   Answer: D  
   Explanation:  
   D) Book value ROI:  
   Bleach:  $150,000 / $225,000 = 0.67  
   Cleanser: $100,000 / $450,000 = 0.22
   Diff: 2  
   Terms: return on investment (ROI)  
   Objective: 3  
   AACSB: Analytical skills

2) What are Bleach's and Cleanser's return on investment based on current values, respectively?
   A) 0.22; 0.67  
   B) 0.42; 0.52  
   C) 0.52; 0.42  
   D) 0.67; 0.22
   Answer: C  
   Explanation:  
   C) Current ROI:  
   Bleach:  $155,000 / $300,000 = 0.52  
   Cleanser: $105,000 / $250,000 = 0.42
   Diff: 2  
   Terms: return on investment (ROI), current cost  
   Objective: 3  
   AACSB: Analytical skills
3) What are Bleach's and Cleanser's residual incomes based on book values, respectively?
A) $116,250; $32,500
B) $110,000; $67,500
C) $67,500; $110,000
D) $37,500; $116,250
Answer: A
Explanation:
A) Book value RI:
   Bleach: $150,000 - ($225,000 \times 0.15) = $116,250
   Cleanser: $100,000 - ($450,000 \times 0.15) = $32,500
Diff: 2
Terms: residual income residual income (RI)
Objective: 3
AACSB: Analytical skills

Answer the following questions using the information below:

Carriage Incorporated manufactures horse carriages. The company has two divisions, Wheels and Assembly. Because of different accounting methods and inflation rates, the company is considering multiple evaluation measures. The following information is provided for 2009:

<table>
<thead>
<tr>
<th></th>
<th>ASSETS</th>
<th>INCOME</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Book value</td>
<td>Current value</td>
</tr>
<tr>
<td>Wheels</td>
<td>$485,000</td>
<td>$550,000</td>
</tr>
<tr>
<td>Assembly</td>
<td>$750,000</td>
<td>$1,200,000</td>
</tr>
</tbody>
</table>

The company is currently using a 12% required rate of return.

4) What are Wheels's and Assembly's return on investment based on book values, respectively?
A) 0.21; 0.25
B) 0.25; 0.21
C) 0.14; 0.25
D) 0.25; 0.14
Answer: B
Explanation:
B) Book value ROI:
   Wheels: $120,000/$485,000 = 0.25
   Assembly: $160,000/$750,000 = 0.21
Diff: 2
Terms: return on investment (ROI)
Objective: 3
AACSB: Analytical skills
5) What are Wheels's and Assembly's return on investment based on current values, respectively?
A) 0.21; 0.25
B) 0.25; 0.21
C) 0.14; 0.25
D) 0.25; 0.14
Answer: D
Explanation:
D) Book value ROI:
   Wheels: $140,000/$550,000 = 0.25
   Assembly: $172,500/$1,200,000 = 0.14
Diff: 2
Terms: return on investment (ROI), current cost
Objective: 3
AACSB: Analytical skills

6) What are Wheels's and Assembly's residual incomes based on book values, respectively?
A) $74,000; $28,500
B) $61,800; $70,000
C) $63,500; $59,500
D) $28,500; $74,000
Answer: B
Explanation:
B) Book value RI:
   Wheels: $120,000 - ($485,000 × 0.12) = $61,800
   Assembly: $160,000 - ($750,000 × 0.12) = $70,000
Diff: 2
Terms: residual income residual income (RI)
Objective: 3
AACSB: Analytical skills

7) The cost today of purchasing an asset identical to the one currently held is called a(n):
A) actual cost
B) current cost
C) dual cost
D) fixed cost
Answer: B
Diff: 2
Terms: current cost
Objective: 3
AACSB: Reflective thinking

8) Residual income calculations are similar to EVA® calculations because in each calculation there is a charge for the division's invested capital which is deducted from a measure of that division's profit.
Answer: TRUE
Diff: 2
Terms: residual income, economic value added (EVA®)
Objective: 2, 3
AACSB: Analytical skills

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9) Current cost return on investment is a better measure of the current economic returns from an investment than historical cost return on investment.
Answer: TRUE
Diff: 2
Terms: current cost, return on investment (ROI)
Objective: 3
AACSB: Reflective thinking

10) A firm will see a difference in the return on investment amount depending if they use historical cost or current cost valuation methods for the assets.
Answer: TRUE
Diff: 2
Terms: return on investment
Objective: 3
AACSB: Analytical skills

11) Using net book value as an investment base is consistent with the amount of total assets shown in the conventional balance sheet.
Answer: TRUE
Explanation: Using net book value as an investment base is consistent with the amount of total assets shown in the conventional balance sheet.
Diff: 2
Terms: return on investment
Objective: 3
AACSB: Analytical skills

12) Using net book value as an investment base will result in a lower ROI than using gross book value as an investment base.
Answer: FALSE
Explanation: Using gross book value as an investment base will result in a lower ROI than using net book value as an investment base.
Diff: 2
Terms: return on investment
Objective: 3
AACSB: Reflective thinking

13) When using the historical cost of assets for calculation of return on investment, is it better to use the gross book value of the assets or the net book value of the assets? Discuss.
Answer: Although the most frequently used measure of assets by companies is the net book value, there are advantages and disadvantages of each option.
Those who use the net book value will note that it is consistent with the assets shown in the conventional balance sheet, and that it is consistent with the income computations that include deductions for depreciation expense.
Those who favor using the gross book value calculation will note that it is more likely to be able to compare ROI across the subunits.
Diff: 3
Terms: return on investment (ROI)
Objective: 3
AACSB: Reflective thinking
Objective 23.4

1) When managers set and measure target levels of performance
A) historical-cost-based accounting measures are usually adequate for evaluating economic returns on new investments.
B) historical-cost ROIs cannot be used to evaluate current performance.
C) the timing of feedback is not dependent on the sophistication of the organization’s information technology.
D) the timing of feedback depends on the specific level of management receiving the feedback.
Answer: D
Diff: 2
Terms: return on investment
Objective: 4
AACSB: Reflective thinking

Objective 23.5

1) If a company is a multinational company with operations in several different countries, one way to achieve comparability of historical-cost based ROIs for facilities in different countries is to:
A) restate the results of operations using the cash basis method of accounting
B) use GAAP for all reporting and calculations
C) restate the results of all operations in dollars
D) All of these answers are correct.
Answer: C
Diff: 2
Terms: return on investment (ROI)
Objective: 5
AACSB: Multiculturalism and diversity

2) Which of the following statements is true?
A) The economic, legal, political, social, and cultural environments differ across countries.
B) Governments in some countries may impose controls and limit selling prices of a company's products.
C) Because of advances in telecommunications and transportation, the availability of materials and skilled labor does not differ significantly across countries.
D) Both A and B are correct.
Answer: D
Diff: 2
Terms: Balanced Scorecard
Objective: 5
AACSB: Multiculturalism and diversity
3) _______ and _______ would be uncontrollable factors that a firm would need to consider when evaluating the return on investment of an international division.
   A) Manager's experience; currency stability
   B) Manager's compensation; political climate
   C) Required rate of return; legal requirements
   D) Custom duties; cultural environment
   Answer: D
   Diff: 2
   Terms: return on investment
   Objective: 5
   AACSB: Multiculturalism and diversity

4) In performance evaluations:
   A) the performance of the division prior to the manager assuming control should be considered
   B) economic conditions for the specific industry should not be considered
   C) to have an effective and fair evaluation, a manager should be evaluated over several time periods
   D) Both A and C are correct.
   Answer: D
   Diff: 2
   Terms: Balanced Scorecard
   Objective: 5
   AACSB: Reflective thinking

5) Comparing the performance of divisions of a multinational company operating in different countries is difficult due to the differences in economic, legal, political, social, and cultural environments.
   Answer: TRUE
   Diff: 1
   Terms: Balanced Scorecard
   Objective: 5
   AACSB: Multiculturalism and diversity

6) One way to achieve greater comparability of historical cost-based ROIs for a company's foreign division is to restate performance in dollars.
   Answer: TRUE
   Diff: 2
   Terms: return on investment (ROI)
   Objective: 5
   AACSB: Multiculturalism and diversity
7) Discuss the issues and complications that may arise when multinational corporations conduct performance measurement and comparisons among divisions located in different countries. Answer: There are wide differences in legal, political, social, and cultural environments among countries.

Many governments impose price and import/export controls on various products. Availability of materials and skilled labor as well as power, transportation, and communication grids are likely to create significant issues.

Divisions operating in different countries account for their performance in different currencies. The exchange rates will fluctuate and there will be differences and effects as a result of levels of inflation, which will need to be reconciled with adjustments to the measurement criteria established.

Diff: 3
Terms: performance measure
Objective: 5
AACSB: Multiculturalism and diversity

Objective 23.6

1) A problem with rewarding managers only on the basis of residual income is that:
A) residual income is difficult to measure
B) on occasion the items in the residual income calculation are not quantifiable
C) residual income can depend on items over which the manager has little control
D) All of these answers are correct.

Answer: C
Diff: 2
Terms: residual income residual income (RI)
Objective: 6
AACSB: Reflective thinking

2) ________ describes contexts in which an employee prefers to exert less effort than the effort that the owner wants because the employee's effort cannot be accurately monitored and enforced.
A) Goal congruence
B) Moral hazard
C) Management compensation
D) Incentive compensation

Answer: B
Diff: 1
Terms: moral hazard
Objective: 6
AACSB: Reflective thinking

3) Tying performance measures more closely to a manager's efforts:
A) encourages the use of nonfinancial measures
B) results in a strict use of financial ratios
C) results in the salary component of compensation dominating the total compensation package
D) Both A and C are correct.

Answer: A
Diff: 2
Terms: Balanced Scorecard
Objective: 6
AACSB: Reflective thinking
4) Relative performance evaluation:
   A) is called benchmarking
   B) filters out the effect of common noncontrollable factors
   C) results in managers having no incentive to help one another
   D) All of these answers are correct.
   Answer: D
   Diff: 2
   Terms: benchmarking
   Objective: 6
   AACSB: Reflective thinking

5) Team incentives encourage cooperation by:
   A) forcing people to work together on difficult tasks
   B) improving morale
   C) letting individuals help one another as they strive toward a common goal
   D) rewarding all teams the same amount
   Answer: C
   Diff: 1
   Terms: Balanced Scorecard
   Objective: 6
   AACSB: Communication

6) Many manufacturing, marketing, and design problems require employees with multiple skills; therefore, teams are used and the members have the added encouragement of:
   A) individual incentives
   B) management incentives
   C) morale incentives
   D) team incentives
   Answer: D
   Diff: 1
   Terms: Balanced Scorecard
   Objective: 6
   AACSB: Reflective thinking

7) Designers of executive compensation plans emphasize which of the following factors?
   A) achievement of organizational goals
   B) administrative ease
   C) the probability that the executives affected by the plan will perceive the plan as fair
   D) All of these answers are correct.
   Answer: D
   Diff: 2
   Terms: Balanced Scorecard
   Objective: 6
   AACSB: Reflective thinking
8) The situation in which an employee prefers to exert less effort compared with the effort desired by the owner because the employee's effort CANNOT accurately be monitored and enforced is known as a(n):
A) incentive
B) moral hazard
C) objective
D) imputed cost
Answer: B
Diff: 1
Terms: moral hazard
Objective: 6
AACSB: Reflective thinking

9) An important consideration in designing compensation arrangements is the tradeoff between creating incentives and imposing risks.
Answer: TRUE
Diff: 1
Terms: moral hazard
Objective: 6
AACSB: Analytical skills

10) Moral hazard describes contexts in which an employee prefers to exert less effort than the effort that the owner wants because the employee's effort CANNOT be accurately monitored and enforced.
Answer: TRUE
Diff: 1
Terms: moral hazard
Objective: 6
AACSB: Ethical reasoning

11) Another term for benchmarking is a relative performance evaluation.
Answer: TRUE
Diff: 1
Terms: benchmarking
Objective: 6
AACSB: Reflective thinking

12) Evaluating an executive's performance using the annual return on investment would sharpen an executive's long-run focus.
Answer: FALSE
Explanation: Using return on investment is a short-run tool.
Diff: 2
Terms: return on investment (ROI)
Objective: 6
AACSB: Analytical skills
13) Managers only employ one task as a part of their job, and thus evaluation of how well they do is simple to accomplish.
Answer: FALSE
Explanation: Managers employ many tasks as a part of their job, and thus evaluation of how well they do is difficult to accomplish.
Diff: 2
Terms: Balanced Scorecard
Objective: 6
AACSB: Analytical skills

14) The only criticism of team-based compensation is that the incentives for individual employees to excel are diminished, harming overall performance.
Answer: FALSE
Explanation: An additional criticism is that there can be problems managing team members who are not productive contributors to the team's success but who, nevertheless, share in the team's rewards.
Diff: 2
Terms: Balanced Scorecard
Objective: 6
AACSB: Analytical skills
15) The Coffee Division of American Products is planning the 20X5 operating budget. Average operating assets of $1,500,000 will be used during the year and unit selling prices are expected to average $100 each. Variable costs of the division are budgeted at $400,000, while fixed costs are set at $250,000. The company's required rate of return is 18%.

Required:

a. Compute the sales volume necessary to achieve a 20% ROI.
b. The division manager receives a bonus of 50% of residual income. What is his anticipated bonus for 20X5, assuming he achieves the 20% ROI from part (a)?

Answer:

a. Target operating income = 0.20 × $1,500,000 = $300,000

<table>
<thead>
<tr>
<th>Operating income</th>
<th>$300,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable costs</td>
<td>400,000</td>
</tr>
<tr>
<td>Fixed costs</td>
<td>250,000</td>
</tr>
<tr>
<td>Target revenues</td>
<td>$950,000</td>
</tr>
</tbody>
</table>

Sales volume = $950,000/$100 = 9,500 units

b.

<table>
<thead>
<tr>
<th>Asset base</th>
<th>$1,500,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum rate × 0.18</td>
<td></td>
</tr>
<tr>
<td>Required return</td>
<td>$270,000</td>
</tr>
<tr>
<td>Target operating income</td>
<td>$300,000</td>
</tr>
<tr>
<td>Required return</td>
<td>270,000</td>
</tr>
<tr>
<td>Residual income</td>
<td>$30,000</td>
</tr>
</tbody>
</table>

Bonus = $30,000 × 0.50 = $15,000  

Diff: 3  
Terms: return on investment (ROI), residual income residual income (RI)  
Objective: 2, 6  
AACSB: Analytical skills
16) LaserLife Printer Cartridge Company is a decentralized organization with several autonomous divisions. The division managers are evaluated, in part, on the basis of the change in their return on invested assets. Operating results for the Packer Division for 20X5 are budgeted as follows:

<table>
<thead>
<tr>
<th>Sales</th>
<th>$5,000,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less variable costs</td>
<td>2,500,000</td>
</tr>
<tr>
<td>Contribution margin</td>
<td>2,500,000</td>
</tr>
<tr>
<td>Less fixed expenses</td>
<td>1,800,000</td>
</tr>
<tr>
<td><strong>Net operating income</strong></td>
<td><strong>$ 700,000</strong></td>
</tr>
</tbody>
</table>

Operating assets for the division are currently $3,600,000. For 20X5, the division can add a new product line for an investment of $600,000. The new product line will generate sales of $1,600,000 and will incur fixed expenses of $600,000 annually. Variable costs of the new product will average 60% of the selling price.

**Required:**

a. What is the effect on ROI of accepting the new product line?

   b. If the company's required rate of return is 6% and residual income is used to evaluate managers, would this encourage the division to accept the new product line? Explain and show computations.

**Answer:**

a.

<table>
<thead>
<tr>
<th>New investment:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sales</td>
</tr>
<tr>
<td>Variable costs</td>
</tr>
<tr>
<td>Fixed costs</td>
</tr>
<tr>
<td><strong>Operating income</strong></td>
</tr>
</tbody>
</table>

Current ROI = $700,000/$3,600,000 = 0.194
New investment ROI = $40,000/$600,000 = 0.067
Combined ROI = $740,000/$4,200,000 = 0.176

Accepting the new product line will reduce the division's ROI. This would make the manager reluctant to make the investment.

b.

<table>
<thead>
<tr>
<th>Investment</th>
<th>$600,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum return</td>
<td>× 0.06</td>
</tr>
<tr>
<td>Required amount</td>
<td>$ 36,000</td>
</tr>
</tbody>
</table>

Income $40,000
Required amount 36,000
Residual income $ 4,000

The manager would accept the investment because income is increased by $4,000.

Diff: 2
Terms: return on investment (ROI), residual income residual income (RI)
Objective: 2, 6
AACSB: Analytical skills
17) Capital Investments has three divisions. Each division's required rate of return is 15%. Planned operating results for 20X5 are as follows:

<table>
<thead>
<tr>
<th>Division</th>
<th>Operating income</th>
<th>Investment</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>$15,000,000</td>
<td>$100,000,000</td>
</tr>
<tr>
<td>B</td>
<td>$25,000,000</td>
<td>$125,000,000</td>
</tr>
<tr>
<td>C</td>
<td>$11,000,000</td>
<td>$ 50,000,000</td>
</tr>
</tbody>
</table>

The company is planning an expansion, which will require each division to increase its investments by $25,000,000 and its income by $4,500,000.

**Required:**

a. Compute the current ROI for each division.

b. Compute the current residual income for each division.

c. Rank the divisions according to their current ROIs and residual incomes.

d. Determine the effects after adding the new project to each division's ROI and residual income.

e. Assuming the managers are evaluated on either ROI or residual income, which divisions are pleased with the expansion and which ones are unhappy?

**Answer:**

a. A ROI = $15,000,000/$100,000,000 = 0.15
   B ROI = $25,000,000/$125,000,000 = 0.20
   C ROI = $11,000,000/$50,000,000 = 0.22

b. A RI = $15,000,000 - ($100,000,000 x 0.15) = $0
   B RI = $25,000,000 - ($125,000,000 x 0.15) = $6,250,000
   C RI = $11,000,000 - ($50,000,000 x 0.15) = $3,500,000

   2. B    2. C
   3. A    3. A

d. A ROI = $19,500,000/$125,000,000 = 0.156
   B ROI = $29,500,000/$150,000,000 = 0.197
   C ROI = $15,500,000/$75,000,000 = 0.207

   A RI = $19,500,000 - ($125,000,000 x 0.15) = $750,000
   B RI = $29,500,000 - ($150,000,000 x 0.15) = $7,000,000
   C RI = $15,500,000 - ($75,000,000 x 0.15) = $4,250,000
e. Everyone would be pleased if residual income was used because residual incomes increase with the expansion. However, it would be difficult to evaluate each division on a comparative basis because each division's investment base is different.

Only the manager of Division A is pleased with the new investment if ROI is used because that is the only division with an increased ROI. In the case of additional investments that are required by corporate management, residual income may be the best to use for evaluating each manager individually, but not collectively.

Diff: 3
Terms: return on investment (ROI), residual income residual income (RI)
Objective: 2, 6
AACSB: Analytical skills

18) R&D Storage is a small, but diversified, moving and storage company. In recent years, its corporate income has declined to unacceptable levels. To change the direction of the company, the board of directors hired a new chief executive officer. She is currently considering three alternative ways to reward division managers for performance. They are:

1. Give each manager a competitive salary with no bonus for performance.

2. Give each manager a base salary with the largest portion being a bonus based on performance, ROI being the yardstick.

3. Give each manager a base salary with a bonus based on comparative performance with the other divisions.

**Required:**
Evaluate each of the ideas, giving strengths and weaknesses.

**Answer:**
1. Opportunities for salary increases might be decided via other means such as improvements in employee motivation, cost savings ideas, or improved management skills. This method will fit some types of situations and managers better than the bonus methods, but should not be used in situations where a high degree of motivation is desired.

2. The second idea is good for motivating a manager to improve the performance of each given division. A weakness in this method occurs when managers make decisions that maximize return on investment in the short run because they have no intent to stay with the company over a long period of time.

3. The third method is great for motivating managers to compete with each other. However, some reward should be available for the lowest rated manager if that manager's performance is, in fact, above the company's standard for performance. Suboptimization is a potential problem with this approach if the winning manager's bonus is substantially above everyone else's bonus.

Diff: 2
Terms: return on investment (ROI), balanced scorecard
Objective: 6
AACSB: Analytical skills
Objective 23.7

1) Which of the following is a difference between a diagnostic control system and an interactive control system?
A) A diagnostic control system focuses on meeting expectations, while an interactive control system focuses on standards of ethical behavior.
B) A diagnostic control system focuses on standards of ethical behavior while an interactive control system focuses on meeting expectations.
C) A diagnostic control system focuses on meeting expectations, while an interactive control system focuses on organizational attention and learning on key strategic issues.
D) A diagnostic control system focuses on organizational attention and learning on key strategic issues, while an interactive control system focuses on meeting expectations.

Answer: C
Diff: 2
Terms: diagnostic control systems, interactive control systems
Objective: 7
AACSB: Reflective thinking

2) A part of a control system that focuses on meeting expectations is known as a(n):
A) diagnostic control system
B) boundary system
C) belief system
D) interactive control system

Answer: A
Diff: 2
Terms: diagnostic control, boundary, belief, and interactive control systems
Objective: 7
AACSB: Reflective thinking

3) A part of a control system that describes standards of behavior and codes of conduct expected of all employees, especially actions that are off-limits, is known as a(n):
A) diagnostic control system
B) boundary system
C) belief system
D) interactive control system

Answer: B
Diff: 2
Terms: diagnostic control, boundary, belief, and interactive control systems
Objective: 7
AACSB: Ethical reasoning
4) A part of a control system that articulates the mission, purpose, and core values of a company is known as a(n):
A) diagnostic control system
B) boundary system
C) belief system
D) interactive control system
Answer: C
Diff: 2
Terms: diagnostic control, boundary, belief, and interactive control systems
Objective: 7
AACSB: Communication

5) A part of a control system that attempts to focus an organization's attention and learning on key strategic issues is known as a(n):
A) diagnostic control system
B) boundary system
C) belief system
D) interactive control system
Answer: D
Diff: 2
Terms: diagnostic control, boundary, belief, and interactive control systems
Objective: 7
AACSB: Reflective thinking

6) Managers use ________ to create an ongoing dialog around the organization's key strategic issues to personally involve themselves in subordinates' decision-making activities.
A) diagnostic control systems
B) boundary systems
C) belief systems
D) interactive control systems
Answer: D
Diff: 2
Terms: diagnostic control, boundary, belief, and interactive control systems
Objective: 7
AACSB: Communication

7) "Levers of control," in addition to a diagnostic control system, are needed in an organization because:
A) diagnostic controls have been found to lead to poor financial performance
B) diagnostic controls have no place in a Balanced Scorecard system
C) pressure to perform on diagnostic controls may lead to unethical behavior
D) they are mandated by the Financial Accounting Standards Board
Answer: C
Diff: 3
Terms: diagnostic control, boundary, belief, and interactive control systems
Objective: 7
AACSB: Reflective thinking
8) Examples of "cooking the books" are understated assets and overstated liabilities.
Answer: FALSE
Explanation: Cooking the books is overstating assets and understating liabilities.
Diff: 1
Terms: moral hazard
Objective: 7
AACSB: Reflective thinking

9) Residual income is a better evaluation method than return on investment because it has a lower required rate of return for the company projects than return on investment does.
Answer: FALSE
Explanation: A company can make a decision using the same required rate of return with either return on investment or residual income.
Diff: 1
Terms: residual income, return on investment (ROI)
Objective: 7
AACSB: Reflective thinking

10) An interactive control system is a formal information system that managers use to focus organization attention and learning on key strategic issues.
Answer: TRUE
Diff: 2
Terms: interactive control system
Objective: 7
AACSB: Communication

11) Boundary systems describe standards of behavior and codes of conduct expected of all employees, especially actions that are off-limits.
Answer: TRUE
Diff: 2
Terms: boundary systems
Objective: 7
AACSB: Ethical reasoning

12) The "four levers" of control are diagnostic control systems, boundary systems, belief systems, and interactive control systems.
Answer: TRUE
Explanation: The "four levers" of control are diagnostic control systems, boundary systems, belief systems, and interactive control systems.
Diff: 2
Terms: levers of control
Objective: 7
AACSB: Reflective thinking
13) Measures which monitor critical performance variables that help managers track progress toward achieving a company's strategic goals are collectively called diagnostic control systems.
Answer: TRUE
Diff: 2
Terms: diagnostic control systems
Objective: 7
AACSB: Reflective thinking

14) Briefly explain each of the four levels of control. Why does a company need to implement more than a diagnostic control system?
Answer: The four levers of control are diagnostic control systems, boundary systems, belief systems, and interactive control systems. Companies must strive for performance, behave ethically, inspire employees, and respond to strategic threats and opportunities in the environment. Diagnostic control systems involve measures that help a company to diagnose whether or not a company is performing according to expectations. Boundary systems describe standards of behavior and codes of conduct expected of all employees, especially actions that are off-limits. Belief systems articulate the mission, purpose, and core values of a company. Interactive control systems are formal information systems that managers use to focus organization attention and learning on key strategic issues.

The "levers of control," in addition to diagnostic control systems, are needed since the pressure to perform on diagnostic goals can be so strong that management might take steps to cut corners and make their performance look better than it really is. In addition, diagnostic systems might focus management too much on meeting short term goals that organization learning and attention to key strategic issues might be inadequate for the future.
Diff: 2
Terms: diagnostic control, boundary, belief, and interactive control systems
Objective: 7
AACSB: Reflective thinking