



Student Name: ..... ID: ..... Grade: /40

1. Explain what software engineering fundamentals apply to all types of software systems. [4pts]

**Sol:**

- a. *Systems should be developed using a managed and understood development process.*
- b. *Dependability and performance are key system characteristics*
- c. *Understanding and managing the software specification and requirements are important.*
- d. *Effective re-use should be made of available resources.*

2. List the 3 generic process models that are used in software engineering. [3pts]

**Sol:**

- a. *The waterfall model*
- b. *Incremental development*
- c. *Re-use oriented software engineering*

3. Describe four (4) general characteristics of the Waterfall model. [4pts]

**Sol:**

- a. *It is a plan-driven software development process*
- b. *Documents are produced (signed off) at the end of each phase*
- c. *The following phase does not start until the previous phase has finished*
- d. *It is difficult to make changes which involves significant rework*

4. Explain the principal software specification (requirements engineering) activities. [4pts]

**Sol:**

- a. *Feasibility study* – determine if it is feasible to continue with project
- b. *Requirements elicitation and analysis* – gather, classify, and organize the requirements
- c. *Requirements specification* – document the requirements to communicate to project team
- d. *Requirements validation* – check that the requirements are complete, correct, & consistent

5. Outline and explain the process of requirements elicitation. [4pts]

**Sol:**

- a. *Discovery*; the process of interacting with stakeholders to discover their requirements for the system
- b. *Classification and organization*; groups related requirements and organize them into clusters
- c. *Prioritization and negotiation*; prioritize requirements and finding/resolving conflicts
- d. *Specification*; the requirements are documented and used as input into the next round

6. Explain the object-oriented (UML) models used in requirements specification. [4pts]

**Sol:**

Object-Oriented models during system analysis include:

- a. *Use Case Diagrams* – documents use cases with actors and their interaction with the system
- b. *Use Case Descriptions* – high level description of individual use cases & scenarios
- c. *Model Domain Class Diagrams* – two compartments completed with class name & attributes
- d. *System Sequence Diagrams* – models the system as a black box and its interaction with actors via messages

7. Describe four (4) principles of agile methods. [2pts]

**Sol:**

- a. *Incremental delivery*
- b. *Customer involvement*
- c. *Concentrate on people not process*
- d. *Embrace change*
- e. *Maintain simplicity*

8. Describe the shared characteristics that are common to different approaches of rapid software development? [3pts]

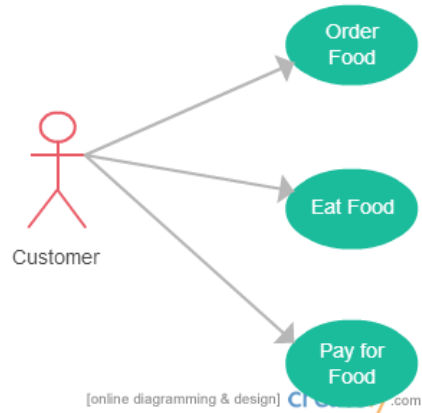
**Sol:**

- a. The processes of specification, design and implementation are *inter-leaved*
- b. The system is developed and delivered as a *series of versions*
- c. *User interfaces* are often developed using an *interactive development system* that supports rapid UI development

9. From your project (Restaurant Automation), do the following: [6pts]  
 a. draw three use cases of a customer. [3pts]  
 b. write three user stories of a manager. [3pts]

**Sol:**

- a. three use cases of a customer:



- b. three user stories of a manager:

1. I want to create a new user accounts for my employees, so that they may perform their relevant duties through touch screen
2. I want to add and remove tables to my restaurant, specifying the number of seats they have, so that customers are only offered tables with enough seats.
3. I want to alter an employee's permissions, so that they only retain access to the services that concern them.

10. Show by graph A general model of the design process (Design Inputs, activities, and outputs) [6pts]

**Sol:**

