Final Exam

Student Name: 
Student Id: 

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Question 1 : ( 10 Point)
Choose the correct answer

1) The type of variable whose allocated storage is 4 byte and contains values that can be stored are positive or negative whole numbers
   a. float            b. int            c. bool            d. long

2) A procedural set of instruction or statements, that may take argument then perform some work, and may return a result
   a. property         b. object         c. class           d. function

3) Special words or symbol that denote a special meaning to the compiler and cannot be used for variable or function names are:
   a. language primitives  b. subroutines   c. header names       d. reserved or keywords

4) Variable that can be accessed and altered only within the function in which they are defined are called:
   a. user defined variables  b. static variables  c. local variables   d. global variables

5) The C++ data type that can take on either one of only two possible values is known as
   a. binary            b. character       c. short            d. boolean

6) The modulus operator "%" is used in division to return the
   a. dividend          b. quotient        c. divisor         d. remainder

7) The clause in the SWITCH is executed if no CASE statement match within the "SWITCH/CASE" block:
   a. finally clause    b. catch clause    c. default clause   d. exception routine

8) Passing argument be means of making a copy of the variable's content is known as passing by:
   a. value            b. name            c. reference       d. inheritance

9) The function that must always return control to the operating system is known as:
   a. private          b. header          c. initial method   d. main

10) The function the return no result is said to have a return value of
    a. int              b. undeclared     c. void            d. double
Question 2 : (10 Point)
What is the output of the following code fragment?

**Part 1**
```cpp
int A = 1;
int B = 2;
if (((A == 1) || (B == 2)) && (B == 0))
    cout << "This exam was difficult ";
else
    cout << "This exam was easy ";
```

*Output:*

**Part 2**
```cpp
int main() {
    char *a[] = { "Argentina", "Korea", "Greece", "Nigeria"};
cout << *(a+1) << endl;
cout << *a[0] << endl;
cout << a[3] << endl;
cout << a[3][1] << endl;
return 0;
}
```

*Output:*

**Part 3**
```cpp
double *pt;
double a[3] = {1.2, 2.3, 3.4};
pt = &a[1];
pt += 1;
cout << *pt << endl;
```

*Output:*

**Part 4**
```cpp
#include <string>
int main() {
    string A = "Good morning";
    string B = "Good afternoon";
    if (A > B)
        cout << A;
    else
        cout << B;
    return 0;
}
```

*Output:*
Question 3: (10 Point)
Write a program that prompts the user to enter the year and month, and displays the number of days in the month. For example, if the user entered month 2 and year 2000, the program should display that February 2009 has 29 days. If the user entered month 3 and year 2005, the program should display that March 2010 has 31 days.
Question 4: (10 Point)
Write (C++) code, including a loop, required to calculate $y(t)$ from the equation:

$$y(t) = \begin{cases} 
-3t^2 + 5 & t \geq 0 \\
3t^2 + 5 & t < 0 
\end{cases}$$

for values of $t$ between -9 and 9 in steps of 3. Display each value of $t$ and $y(t)$. 

Question 5 : ( 10 Point)

**Part1**
When asked to create a program to find the volume of any cone, given its radius and height, a programmer created this program to implement the formula \( V = \frac{1}{3} \pi r^2 h \). It compiles, and it runs, but it gives completely incorrect results.
A serious problem lies in the `ComputeVolume` function. Additionally, the programmer was confused about parameters and local variables. **Make this function work correctly**, and also **improve its use of parameters**, changing main as necessary. Note any other minor or stylistic errors you might and throughout the program. You can simply note changes on the program listing.

```cpp
double ComputeVolume ( double r, double h, double ans , double r2 );

int main (){  
double radius , height , ans , r2;  
cout<<" Radius : "<< radius;  
cout<< " Height : " << height;  
ans = ComputeVolume (radius , height , ans , r2 );  
cout<< " Volume :"<<ans; 
}

double ComputeVolume ( double r, double h, double ans , double r2)  
{  r2 = r*r;  
ans = (1/3)* 3.14 *r2*h;  
return ans ; 
}
```

**Part2**
"Searching is the process of looking for a specific element in an array "
Talk about the searching array techniques and give example
Question 6 (10 point)
Write a function called **MatrixTranspose** to find the transpose of multi-dimensions array. The header of the function as follow:

```c
void MatrixTranspose (int a[][COLUMN_SIZE], int Ta[][COLUMN_SIZE],
                      int rowSize)
```
Question 7(10 point)
Write program that randomly fills in 0s and 1s into a Tic Tac Toe board, print the board, and find out the rows, columns, or diagonal with all 0s or 1s. Use two-dimensional array to present a Tic Tac Toe board. Here is a sample of the program

<table>
<thead>
<tr>
<th>Tic Tac Toe Board</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 0 0</td>
</tr>
<tr>
<td>0 0 1</td>
</tr>
<tr>
<td>1 1 1</td>
</tr>
</tbody>
</table>

All 1s on row 2
All 1s on column 2

Hint : assume the two-dimensional array is 3*3

My best Wishes …
Eng. Wazen M. Shbair