Uva Wellassa University of Sri Lanka
Faculty of Technological Studies
Department of Biosystems Technology
Computer Programming Concepts (BBST251-3)
Assignment 1, 2and 3(Repeat)

Instructions to candidates
Number of questions: Fifteen (15)
Mark allocation: 300
Answer all questions.

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1. Write the **pseudocode, complete C++ program** and draw the **flow chart** for the following scenario.

   The program asks the user to enter two numbers, obtains the two numbers from the user and prints the product of the two numbers.

2.
   I. Briefly describe the classification of Computer Languages
   II. Compare and contrast the Interpreter and Compiler

3. Briefly describe the types of errors in programming with examples.
4. Fill in the blanks in each of the following.

   I. Every C++ program begins execution at the function……..
   II. A ……..begins the body of every function and a…….. ends the body.
   III. Every C++ statement ends with a……..
   IV. The escape sequence \n represents the ……character, which causes the cursor to position to the beginning of the next line on the screen.
   V. The…….. statement is used to make decisions.

5. Write a program that reads in the radius of a circle as an integer and prints the circle's diameter, circumference and area. Use the constant value 3.14159 for π. Do all calculations in output statements.

6. Write a program that prints a box, an oval, an arrow and a diamond as follows:

7. State whether each of the following is true or false. If false, explain why. Assume the statement using std::cout; is used.
   I. Comments cause the computer to print the text after the // on the screen when the program is executed.
   II. The escape sequence \n, when output with cout and the stream insertion operator, causes the cursor to position to the beginning of the next line on the screen.
   III. All variables must be declared before they're used.
   IV. All variables must be given a type when they're declared.
   V. C++ considers the variables **number** and **NuMbEr** to be identical.
   VI. Declarations can appear almost anywhere in the body of a C++ function.
   VII. The modulus operator (%) can be used only with integer operands.
   VIII. The arithmetic operators *, /, %, + and – all have the same level of precedence.
   IX. A C++ program that prints three lines of output must contain three statements using cout and the stream insertion operator

8. Find the errors in each of the following code segments and explain how to correct them.
   I.
```
x = 1;
while ( x <= 10 );
++x;
}
```
   II.
```
for ( y = .1; y != 1.0; y += .1 )
cout << y << endl;
```
   III.
```
switch ( n )
{
case 1:
cout << "The number is 1" << endl;
```

```
case 2:
cout << "The number is 2" << endl;
break;
default:
cout << "The number is not 1 or 2" << endl;
break;
}
```

IV. The following code should print the values 1 to 10.

```
n = 1;
while ( n < 10 )
cout << n++ << endl;
```

9. Answer each of the following
   I. Program components in C++ are called…….. and ……..
   II. A function is invoked with a ……..
   III. A variable known only within the function in which it's defined is called a……..
   IV. The …….. statement in a called function passes the value of an expression back to the calling function.
   V. The keyword …… is used in a function header to indicate that a function does not return a value or to indicate that a function contains no parameters.

10. We introduced the body mass index (BMI) calculator. The formula for calculating BMI is

$$BMI = \frac{weightInKilograms}{heightInMeters\ X\ heghtInMeters}$$

Create a BMI calculator application that reads the user's weight in kilograms and height in meters. Then calculates and displays the user's body mass index (BMI). Also, the application should display the following information from the Department of Health and Human Services/National Institutes of Health so the user can evaluate his/her BMI:

BMI VALUES

Underweight:	less than 18.5
Normal :	between 18.5 and 24.9
Overweight :	between 25 and 29.9
Obese:	30 or greater

11. (Fill in the Blanks) Answer each of the following:
    I. Lists and tables of values can be stored in…….. or…….. .
    II. The elements of an array are related by the fact that they have the same…….. and……..
    III. The number used to refer to a particular element of an array is called its…….. .
    IV. A……should be used to declare the size of an array, because it makes the program more scalable.
    V. The process of placing the elements of an array in order is called…….. the array.
    VI. The process of determining if an array contains a particular key value is called……..array.
    VII. An array that uses two subscripts is referred to as a……..array

12. (Double Array Questions) Answer the following questions regarding an array called table:
    I. Declare the array to be an integer array and to have 3 rows and 3 columns. Assume that the constant variable arraySize has been defined to be 3.
    II. How many elements does the array contain?
    III. Use the for statement (loop) to get the values of the array. Assume that the integer variables i and j are declared as control variables.

13. (Find the Error) Find the error in each of the following program segments and correct the error:
    I. #include <iostream>;
    II. arraySize = 10; // arraySize was declared const
    III. Assume that int b[10] = {};
    for (int i = 0; i <= 10; ++i)
    b[i] = 1;
    IV. Assume that int a[2][2] = { { 1, 2 }, { 3, 4 } };
    [1, 1] = 5;

14. Write a program that uses the **for statement** to calculate and print the product of the odd integers from 1 to 15.

15. Answer each of the following:
    I. A pointer is a variable that contains as its value the…….. of another variable.
    II. The three values that can be used to initialize a pointer are…….. , ……..and……
    III. The only integer that can be assigned directly to a pointer is…….. .