THE OPEN UNIVERSITY OF SRI LANKA

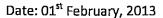
B.Sc DEGREE PROGRAM: LEVEL 04

DEPARTMENT OF MATHEMATICS & COMPUTER SCIENCE

CLOSED BOOK TEST-2012/13 (CBT-1)

CPU2242: OBJECT ORIENTED PROGRAMMING USING C++ AND JAVA

DURATION: ONE AND HALF HOURS (11/2 HOURS)



Time: 4.00pm - 5.30 pm

Answer ALL THREE questions.

Q1.

- a) The following identifier declarations are written in C++ and some of these are syntactically incorrect and not accordance with the C++ programming style standard you have leant. Find these identifiers and precisely write down each error.
 - i. int_incomePerDay;
 - ii. int signed;
 - iii. double surprise!Variable;
 - iv. int 4seasons;
 - v. const int averageHeight;
 - vi. bool valid variable;
 - vii. int TotalCustomers 100;
- b) Write the most suitable variable declaration (including their built-in data type) to represent the following items. Briefly explain the reason to select that particular built-in data type.
 - i. A constant to hold the Avogadro number
 - ii. A variable to hold the number of students in a class
 - iii. A variable to store the average temperature of a city during a month
 - iv. A variable to hold the name of a person
 - v. A list to store names of 40 students in a class room
 - vi. A variable to store the National identity card number (in Sri Lanka)
 - vii. To store marks of 40 students for 8 subjects
- c) Write C++ assignment statements to evaluate the following equations.

i.
$$Delta = b^2 - 4ac$$

ii. Area of a Circle =
$$(\pi \times d^2) / 4$$
;

iv.
$$Z = \left(x - \frac{y}{5}\right) \left(\frac{x^2 + y^2}{x - y}\right)^2$$

v.
$$V_{rms} = \sqrt{\frac{3K_BT}{\mu}}$$

vi.
$$P(X) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{\{\frac{-(x-\mu)^2}{2\sigma^2}\}}$$

Q2.

- a) Determine the value of each of the following. Wrote your steps clearly.
 - i. 8 * 9 + 2
 - ii. 6.0 * 3 /4
 - iii. 5+1&& 10
 - iv. $5 > 10 \mid \mid -6 > -3$
 - v. pow (2,3) > 9?2:3
 - vi. !(10 > 12) || 5 % 2 == 0
- b) Answer the following briefly.
 - i. Why we use functions in a program?
 - ii. What are the advantages and disadvantages of passing a parameter to a function by value and by reference?
- c) Construct function prototypes that match he following descriptions.
 - i. average() takes no argument but returns a float value
 - ii. calc() takes one integer argument and returns the square root of that integer variable
 - iii. increment() takes two integers and increment these values of the variables by one
 - iv. maxMarks() takes a set of maths marks of students and returns the highest student's mark
 - v. longestName() takes a set of names of students in a class and returns the longest student name
 - vi. count() takes <u>a</u> set of digits and alphabetical characters and returns the number of vowels in the list

```
#include<iostream>
using namespace std;
int main()
{
    int i, j, k;
    int n = 8;
    for (i = 1; i \le n; i++)
        for (j = 1; j \le i; j++)
            cout<<'*';
        cout<<'\n';
    }
    for (i = n; i >= 1; i--)
        for(j = 0; j < n - i; j++)
             cout<<' ':
        for (j = 1; j \le i; j++)
             cout<<'*1:
        cout<<'\n';
  }
  cout<<'\n';
  return 0;
```

Q3.

- a) State whether the following are true or false. If the answer is false, explain why.
 - i. An array can store many different types of values.
 - ii. An array index should normally be of data type float.
 - iii. If there are fewer initializers in an initializer list than the number of elements in the array, the remaining elements are initialized to the last value in the initializer list.
 - iv. It's an error if an initializer list has more initializers than there are elements in the array.
 - v. An individual array element that is passed to a function and modified in that function will contain the modified value when the called function completes execution.
- b) Write one or more statements that perform the following tasks for an array called fractions.
 - i. Define a constant integer variable arraySize initialized to 10.
 - ii. Declare an array with arraySize elements of type double, and initialize the elements to 0
 - iii. Name the fourth element of the array.
 - iv. Refer to array element 4.
 - v. Assign the value 1.667 to array element 9.
 - vi. Assign the value 3.333 to the seventh element of the array.
 - vii. Print array elements 6 and 9 with two digits of precision to the right of the decimal point, and show the output that is actually displayed on the screen.

- viii. Print all the array elements using a 'for' statement. Define the integer variable 'i' as a control variable for the loop. Show the output.
- c) Write a C++ program to convert an input value given in degrees Fahrenheit to the corresponding value in degrees Centigrade. Use appropriate functional breakdowns.

Hint :-
$$^{\circ}C = (^{\circ}F - 32) \times \frac{5}{9}$$

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