



**EASTERN UNIVERSITY, SRI LANKA**  
**DEPARTMENT OF MATHEMATICS**

**FIRST EXAMINATION IN SCIENCE (2008/2009)**  
**FIRST SEMESTER (Oct/Nov, 2014)**

**EXTCS103 - INTRODUCTION TO PROGRAM DESIGN  
AND PROGRAMMING  
(Repeat)**

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ANSWER ALL QUESTIONS

TIME: TWO HOURS

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1)

- a. Define the following terms:
- I. Algorithm;
  - II. Flow chart;
  - III. Pseudocode.
- b. Represent the following problems using "Flow chart".
- I. To find the roots of quadratic equation,  $ax^2+bx+c=0$ , where  $a \neq 0$ ;
  - II. To find the leap year;
  - III. To determine a given integer is "odd" or "even";
  - IV. To find the maximum of two (02) numbers.
- c. Evaluate each of the following expressions, where in each that  $m=25$  and  $n=7$ :
- I.  $m-8-n$
  - II.  $m\%n$
  - III.  $m\%n++$
  - IV.  $m\%++n$
  - V.  $++m - n--$

2)

a. Describe the use of **break** and **continue** statements.

b. Consider the following code segment:

```
#include<iostream.h>
#include<conio.h>
void main()
{
clrscr();
for(int i=1;i<=8;i++)
{
    for(int k=1;k<=i;k++)
    {
        if(k%2==0)
            cout<<2*k<<"\t";
        else
            cout<<k<<"\t";
    }
    cout<<endl;
}
getch();
}
```

I. Give the output of the code segment?

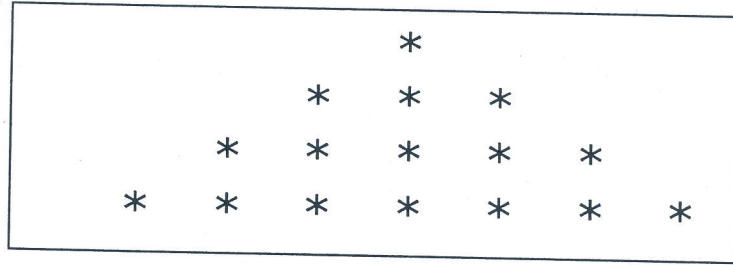
II. Convert the above **for loop** into a **while loop**.

c. Write a program in C++ to display the following pattern using loops.

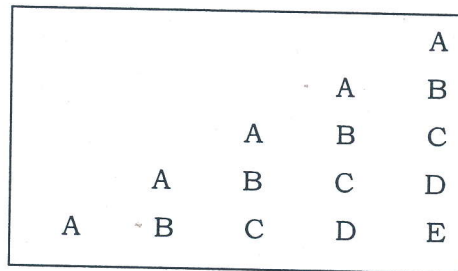
I.

```
1
3 3
5 5 5
7 7 7 7
9 9 9 9 9
11 11 11 11 11 11
```

II.



III.



3)

- a. Write the following power() function that returns x raised to the power n, where n can be any integer.

```
int power ( int x, int n);
```

- b. Write a C++ program to find the sum of the given series using do-while loop:  
 $1, 1/2, 1/3, 1/4, 1/5, 1/6, 1/7, \dots, 1/n$ , where n is a natural number.

- c. Write a C++ program to find the factorial of a positive integer.

Eg:  $3! = 3 * 2 * 1 = 6$

- d. Write the following function that returns the minimum value among the first n elements of the given array:

```
float mini(float a[] , int n) ;
```

4)

- a. Write a C++ program to read six (06) marks from the user, calculate the total marks, and print six (06) marks with total marks.
- b. What is the difference between the two parameter passing techniques “passing by value” and “passing by reference”?
- c. Write a function to swap values of two variables.  
void swap(int a, int b)
- d. Write a function to count the number of words in a string.  
void count(char S[])
- e. Declare a ‘structure’ for a student record consisting of the following fields:  
name;  
id;  
subject\_1\_marks;  
subject\_2\_marks;  
total\_marks.

Write a program to keep records for 5 students including functions to do the following task:

- Insert the student’ details (name, id, subject\_1\_marks, subject\_2\_marks)
- Calculate the total marks for each student
- Display the students’ details and total marks.

\*\*\*\*\* End \*\*\*\*\*