



EASTERN UNIVERSITY, SRILANKA
 DEPARTMENT OF MATHEMATICS
 EXTERNAL DEGREE EXAMINATION IN SCIENCE-2008/2009
 FIRST YEAR, FIRST SEMESTER (July./ Aug., 2010)

EXTCS 103 – INTRODUCTION TO PROGRAM DESIGN AND PROGRAMMING
 (Proper & Repeat)

Answer all questions.

Time : 2 Hours

- Q1.** a) Define *logical error* and *compile-time error* giving two examples for each error.
 b) Draw a flowchart to find the average of a set of 10 positive numbers.
 c) Write a program in C++ to implement the flow chart above in part (b) of Q1.
 d) Evaluate each of the following expressions. Assume that in each case, $m=25$, $n=7$.
1. $m-8-n$
 2. $(--m) / (++n)$
 3. $m\%n$
 4. $m\%(n++)$
 5. $m\%(--n)$
 6. $(m++) - (--n)$

- Q2.** a) Describe the uses of `break` and `continue` statements.
 b) Consider the following C++ code segment:

```
int i=10;
while(i++)
{
    if(i%2)cout << i*i << ", ";
    if(i>=20) break;
}
```

1. Give the output of the code segment.
 2. Convert the above for loop into a while loop.
- c) Write a program in C++ to display the following pattern using loops.

```
&&&&&&
&&&&&
&&&&
&&&&
&&&
&&
&
```

- Q3. a) Define the terms *function declaration* and the *function definition*?
- b) What are the differences between *passing a parameter by value* and *by reference*?
- c) What is wrong with the following declaration? Write the corrected function declaration for `myFunction()`.

```
int myFunction(int a, int b=0, int c);
```

- d) Write a *function declaration* and *function definition* for a function that converts seconds to minutes and seconds. If **129 seconds** is the input passed in, **2 minutes and 9 seconds** should be the output.

- Q4. a) Describe the functionalities of *referencing operator (&)* and *dereferencing operator (*)*.
- b) List the advantages and disadvantages of the pointers in terms of C++ programming Language
- c) What is the output of the following programme?

```
#include<iostream.h>
void main()
{
    int a = 5;
    int b = 7;
    int* p = &a;
    int* q = &b;
    int& r= *q++;

    cout<<++a<<endl;
    cout<<++*p<<endl;
    cout<<*q--<<endl;
    cout<<--b<<endl;
    cout<< r;
}
```

- d) Given the following declaration;

```
int numArray[10]
```

Declare and use the pointers in a 'for loop' to read integer values from the keyboard and store them in to the array `numArray[]`.