EASTERN UNIVERSITY, SRI LANKA

EXTERNAL DEGREE IN SCIENCE

FIRST EXAMINATION IN SCIENCE 2002/03

FIRST SEMESTER (June/July, 2004)

EXCS 103 Introduction to Program Design & Programming

Answer all Questions

Time allowed: 02 hour

Q1

(a) List and explain the functions of all arithmetic operators, the relational operators and the logical operators available in C++.

What would be the output of the following C++ coding?

```
# include<math.h>
int main()
{
        int p=2, q=10, r=25;
        cout<<"p="<<--p<<endl;
        cout<<"p="<<p<<endl;
        cout<<"q="<<q++<<endl;
        cout<<"q="<<q<<endl;
        r%=q;
        cout<<"r="<<r<<endl;
        cout<<"p^q="<<pow(p,q)<<endl;
        return 0;
}
```

(b) Using suitable examples, explain the following control structures in C++:

(i). ***if.....else.....*** constructs

(ii). ***switch.....case*** constructs

Write a program to read marks of a subject and print the given marks with their corresponding grade. The grade is obtained as follows:

	Grade
$0 \leq$ marks ≤ 39	F
$40 \leq$ marks ≤ 49	D
$50 \leq$ marks ≤ 59	C
$60 \leq$ marks ≤ 69	B
$70 \leq$ marks ≤ 100	A

Q2

(a) Describe, with aid of the examples, the functionality of each of the following repetition constructs:

(i). ***while*** loop

(ii). ***do-while*** loop

(iii). ***for*** loop

(b) Explain the terms ***one-dimensional*** array and ***two-dimensional*** array.

(c) Write a program to store 15 integers in an array and sort them in ascending order.

(d) Write a program to store characters in a (5X4) array and search for a specific character. Your program should output the location of the first occurrence when doing the search row by row.

Q3

(a) Describe the parameter passing mechanism of C++ functions.

(b) Write a function to swap values of two **float** type variables.

(c) Write a function

void *DecimalIn*(int & n);

that reads a base 10 (decimal) number and assigns it to n.

Use ***DecimalIn*** in a main program that reads a set of decimal numbers and prints the binary equivalent.

(d) What do you mean by a recursive function?

Write a recursive function to calculate factorial of a given integer number.

Q4

(a) (i) What is meant by a ***pointer***?

(ii) How would you create a pointer variable?

(iii) Briefly explain the *pointer arithmetic* in C++.

Write a program to read a name and display the reverse of that name. For example, if the given input is ***sitha*** then output will be ***ahtis***.

(b) Define the keyword ***struct*** and ***union*** in C++.

Write a program to read name, sex, city, date of birth and salary of some employees, and then display employees' details in a tabular format.