NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCE
COMPUTER SCIENCE DEPARTMENT
DECEMBER EXAMINATIONS 2001

SUBJECT: ADVANCED PROGRAMMING
CODE: SCS 4105

Instructions to candidate:

Answer any five full questions out of seven.
All questions carry equal marks.
Programs should be written in C++.

TIME: 3 HOURS

QUESTION ONE

a) Discuss the issues needed to resolve the software crisis?   [10]

b) Compare the characteristics of procedural programming over object

    oriented concept.   [5]

c) Explain briefly the basic concepts of object oriented programming?   [5]

QUESTION TWO

a) Explain the manipulator operators supported by C++ with programming

    example?   [10]

b) What is the output of the of the following program segment:

```
#include<iostream.h>
#include<iomanip.h>
void f();
void g();
int x = 11;
main()
    { int x = 22;
        {int x = 33;
            cout<<"In block inside main() : x = " << x << endl;
        }
    cout<<"In main (): x = " << x << endl;
    cout<< In main () :  ::x = " << :: x<< endl;
    f();
    g();
}
    void f()
```

```
                    { int x – 44;
                        cout << "In f(): x = " << x << endl;
                    }
            void g()
                    {
                        cout<<"in g(): x = " << x << endl;
                    }
```
[5]

Note: Don't worry about the syntax errors.

c) Convert the following for loop into while do loop and also write the out put:
```
        for(int i =0; i >10; i--)
            cout<< i * i
```
[5]

QUESTION THREE

a) Define an array? Name the three types of arrays and also write their general syntax of representations? Give at least two applications for each? [5]

b) What is a structure? Give the general syntax for the declaration of structure? Bring out the differences between an array and a structure? [5]

c) Write an interactive program to convert a given decimal number to other bases using single dimensional array? Your program should able to convert to any given base.

> Eg: IF you enter the number as: 23597
>
> Enter the base to be converted: 16
>
> The converted number is: 5C2D

[10]

QUESTION FOUR

a) What is a pointer? What are its advantages? How do you initialize a pointer variable in a program? [5]

b) Illustrate with a programming example how do you access the memory address of a variable? [5]

d) Write a program to find the largest element in a list and also print its position? [10]

2

QUESTION FIVE

a) Explain the following terms with their representations and also give at least one application of each: [8]

    i) Stack

    ii) Queue

    iii) Doubly linked list

    iv) Circular list

b) Write an algorithm to perform the insertion and deletion operation on a queue? [8]

c) Check what is wrong with the following codes:

    i) int int var = 999;

        int * int ptr;

        cout << *int ptr;

    ii) short a[32];

   for (int i = 0; i<32; i++)

        * a++ = i * i; [4]

QUESTION SIX

a) Write an algorithm to search an element using Binary search? What are its drawbacks*? [10]

b) Compare the procedure of sorting between Insertion sort, Selection sort and Shell sort? Which is the best sorting method out of these three? Justify your answer? [10]

a)   Define Binary tree? There are various ways of traversing tree structures. These include:

   a. Preorder traversal

   b. Inorder traversal

   c. Postorder traversal

Using the following tree structure write down the procedure and order in which the node data would be listed using the three traversal methods described above.
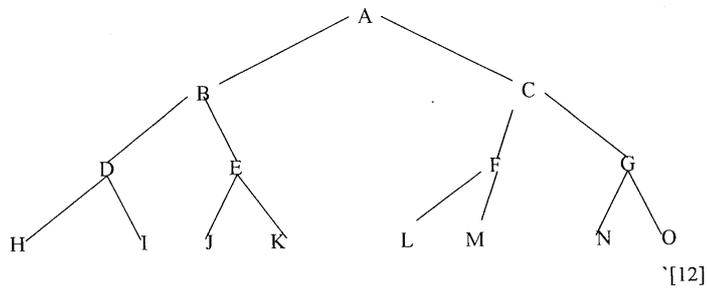
`[12]

b) Define graph? Illustrate with figures different types of undirected and directed graphs?   [8]

END OF QUESTION PAPER

GOOD LUCK!