NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCE
COMPUTER SCIENCE DEPARTMENT
DECEMBER EXAMINATIONS 2004

SUBJECT: STRUCTURED PROGRAMMING
CODE: SCS2107

INSTRUCTION TO CANDIDATES

Answer any five questions
Each question carries 20 marks

Time: 3 hours

QUESTION ONE

i)   What are the objectives of structured programming methods?   [3]

ii)   State five advantages of structured programming.   [5]

iii)   Correct the following piece of code:

```
int *ptr;
float real = 56.21;
ptr=&real;
```
[3]

iv)   What is meant by 'an argument is passed by value'.   [3]

v)   Which type of 'argument in C is not passed by value' and how is it passed?   [3]

vi)   Give the general format of a function prototype in C.   [3]

QUESTION TWO

a)   Write a function called print() which prints the following statement when called
"Try try try again"   [5]

b)   Using a Switch statement write a C program which prompts the user for an integer between 1 and 4 and then prints the statements associated with the integer entered as follows:

1 – "hear and I forget"
2 – "I see and I remember:
3- :I do and I understand"
4- a function call to print() in a)   [15]

QUESTION THREE

a)   Write a C program that accepts and stores 20 integer values in an array.
                                                                    [4]
b)   For your program in **a)** above write a C function that returns the average of the largest and the smallest values in the array.   [8]

c)   Write a C function that subtracts the smallest value in the array from every element in the array. And prints out the resulting array   [8]

QUESTION FOUR

The fibonacci sequence is the series of integers

        0,1,1,2,3,5,8,13,21...........
each element in the series is the sum of the preceding two elements.

Write a C program which calculates and prints the fibonacci sequence up to the ith element inputed by a user using a recursive function called fib()   [20]

QUESTION FIVE

a)   Using appropriate pointer and deferencing notations write a C program that prompts the user to enter a string and then prints the string out in reverse order.   [10]
b)   What are void pointers and how are they useful.   [5]

c)   What is the difference between a structure and an array Give examples of each   .   [5]

QUESTION SIX

a)   Write a C program that writes the numbers 1 to 100 sequentially to a file
     called NUMS.1   [10]

b)   Write a C program that asks the user for a filename and prints the
     contents of the file to screen.   [10]

QUESTION SEVEN

a)   What is top-down programming?   [2]
b)   What is the advantage of top-down programming   [3]
c)   Which do you think is better Object Oriented Programming of Structured
     Programming and why?   [6]
d)   With respect to Object Oriented Programming explain the following:

     i)   Encapsulation   [3]
     ii)   Inheritance   [3]
     iii)   Polymorphism   [3]

END OF QUESTION PAPER

GOOD LUCK!