NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCES
COMPUTER SCIENCE DEPARTMENT
MAY EXAMINATIONS 2011

SUBJECT: **PROGRAMMING AND PROGRAM DESIGN**
CODE: **SCS1201**

<u>**INSTRUCTION TO CANDIDATES**</u>
This question paper consists of six (6) questions. Answer any four (4) questions.
Each question carries 25 marks.

Time: 3 hours

QUESTION ONE

a) Describe the following terms as used in programming and program
design:
  i.   Algorithm   [2]
 ii.   Pseudocode   [2]
iii.   Moduralisation   [2]
 iv.   Loop   [2]
  v.   Code   [2]
b) Outline the characteristics of a good program.   [5]
c) Write a C program that accepts two integer numbers from the user and
then computes the sum and display it.   [10]

QUESTION TWO

a) Evaluate the use of flow charts in programming and program design.
                                                                         [10]
b) In a sequence of fifty numbers, which are non-zero, determine whether
each number is positive or negative. At the end display the total number
of positive ones and the total number of negative ones.
  i.   Draw a flow chart to the problem.   [10]
 ii.   Write a pseudocode to the problem   [5]

QUESTION THREE

a) Highlight the importance of program design. [5]
b) Explain the main requirements of software design methods. [5]
c) Briefly describe the characteristics of JSP. [5]
d) State any four advantages of JSP. [4]
e) Explain in detail the steps involved in the programming process. [6]

QUESTION FOUR

a) With the aid of examples, explain the following statements in C programming:
  i) *While*…. Statement [3]
  ii) *Do….While* Loop [3]
  iii) *If…*.Statement [3]
  iv) *For…*.Statement [3]
  v) Write a program using C as the programming language that would display the following output: 2, 4, 8, 16, 32 and 64. Include this control statement in your program; *While (N <= 32)* where N is the integer.
                                                                                         [5]
b)   JSP structures programs in terms of four components. State and explain these components. [8]

QUESTION FIVE

a)   Explain the design details that should identify the pseudocode. [9]
b)   State all the phases in program logic [3]
c)   With the aid of examples, explain the four basic data types used with C programming. [8]
d)   An attempt was made to write a program using C as a programming language, but with syntax errors.

```
#include <stdio.h>
main()
{
For ( Counting = 0; Counting <= 10; Counting+)
printf("%d\n", Counting);
Return 0
```

  i) Identify the errors and write the correct program. [4]
  ii) What will be the output of this program? [1]

QUESTION SIX

a) State and explain the properties of algorithms.   [6]
b) Write a pseudocode that would prompt the user to enter the price of an item
   being purchased at a retail store and then calculate and display the final price
   including sales tax. Assume the sales tax is 6.5%.   [4]
c) Give any five guidelines that you would use in flowcharting.   [5]
d) A programmer wanted to write a program that would find the sum of the first
   1000 natural numbers. He wants to design his program using a flow chart
   and asks you to assist. Make your contribution by drawing an appropriate
   flow chart that would assist him.   [10]

END OF QUESTION PAPER