NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCE
COMPUTER SCIENCE DEPARTMENT
Examinations – January 2013

SUBJECT: INTRODUCTION TO COMPUTER SCIENCE AND PROGRAMMING
CODE: SCS 1101

Instructions to candidate:

1. Answer all questions from **Section A** and any two from **Section B**.
2. All programming questions to be answered in C
3. Each questions contains 20 marks

                                                                      3 HOURS

Section A

QUESTION ONE

a) Compare and contrast the following:
   i.   Output device and input device   [2]
   ii.   Compiler and interpreter   [4]
   iii.   Knowledge society and Information society   [4]
   iv.   scanf and printf   [4]

b) Explain the two different types of errors in programming. Give examples in your explanation.   [6]

QUESTION TWO

a) Convert
   i. 1001010_2 to base 4   [2]
   ii. 1110.1_2 to base 16   [3]

b) Artificial intelligence is one of the attributes of the fifth generation of computers. Explain artificial intelligence.   [2]

c) Rewrite the C program below using a *for* loop statement   [6]

```
#include <stdio.h>

int main()
{
    int i = 10;

    do{
        printf("Hello %d\n", i );
        i = i -1;
    }while ( i > 0 );
getch();
return 0;
}
```

d) Give the four data types in C and show how they are declared   [4]

e) The size of a file is 14KB. Calculate the size of the file in bits.   [3]

QUESTION THREE

a) Write a C program that converts decimal numbers to binary.   [10]

b) Explain any two differences RAM and ROM memory   [4]

c) Outline the functions of the CPU   [6]

Section B

QUESTION FOUR

a)   Write a program that reads an integer and checks whether it is odd or even. Show the algorithm for this program using a flow chart.
For example:
Enter a number: 25
25 is an odd number.   [20]

QUESTION FIVE

a) The wind chill index (WCI) is calculated from the wind speed v in miles per hour and the temperature t in Fahrenheit. Three formulas are used, depending on the wind speed:

if $(0 <= v <= 4)$ then WCI = t

if $(v >= 45)$ then WCI = 1.6t - 55

otherwise, WCI = $91.4 + (91.4 - t)(0.0203v - 0.304(v)^{1/2} - 0.474)$. Write a program that can calculate the wind chill index.   [15]

b) Explain the functions of an operating system   [5]

QUESTION SIX

a)   It would not be possible for education at NUST with Information Technology. Discuss   [10]

b)   How do you declare the following in C:
   i.   Variable
   ii.   constant
   iii.   function   [4]

c)   Write a C program that finds the greatest number from an array of 5 integers [6]

END OF QUESTION PAPER