MASINDE MULIRO UNIVERSITY OF SCIENCE AND TECHNOLOGY (MMUST)

MAIN CAMPUS

UNIVERSITY EXAMINATIONS

2023/2024 ACADEMIC YEAR

(MAIN EXAM)

FIRST YEAR SECOND SEMESTER EXAMINATIONS

FOR THE DEGREE

IN

ECE, MIE, SRT & ECE

COURSE CODE: ECE 106

COURSE TITLE: COMPUTER PROGRAMMING I

DATE: 26/4/2024   **TIME:** 11:30 AM – 1:30 PM

1.1.1 INSTRUCTIONS TO CANDIDATES
Answer **Questions ONE** and **ANY OTHER TWO.**

TIME: 2 Hours

QUESTION ONE [30marks]

a) Define the following terms: [4marks]
   i. algorithm
   ii. compiler
   iii. var
   iv. Source code

b) Describe any three format specifiers used in C programs. [3Marks]

c) List two ways that can be used in C to define constants. [2Marks]

d) Outline rules followed when declaring variables in C programming. [2Marks]

e) Describe any three types of programming errors [3Marks]

f) Most programs come with user documentation. What are the typical contents of user documentation. [2Marks]

g) Mary, a student in MMUST wrote the following code during programming session.

```
#include <stdio.h>

int main ();

char ch='A';

char str[20]="fresh2refresh.com";

float flt=10.234;

double dbl=20.123456;

int no =150;

printf("character is %d \n",ch);

printf("string is %s\n",str);

printf("float value is %f\n",flt);

printf("integer value is %d\n",no);

printf("double value is %lf\n",dbl);
```

Identify four errors in the above program.

[4 marks]

h) Describe key steps in program development.

[5Marks]

i) Write a program that can initialize the following elements in a two dimensional array of

three rows and four columns as shown below.

40 60 70 50

80 30 60 10

60 20 90 12

The program should compare the elements and display the largest element in the array.

[5Marks]

QUESTION TWO [20marks] ✓

a) Write a C program that prompts length ,width and height of a cuboid; and calculates the
volume of the cuboid. The program should display the volume.   [6Marks]

b) Discuss the WHILE loop using a simple C program.
[4marks]

c) Using appropriate examples, describe any TWO unary operators used in C
programming.   [4Marks]
d) Describe any three preprocessor directives.   [3marks]
e) Write a C assignment statement to evaluate the following equation. [3marks]
    Side=$\sqrt{a^2}$ +b^2 -2abCOS(x)

b) write a C program that can be used to award depending on the average mark of a student using the criteria below   [8 marks]

Average mark	Award
>=80	Distinction
>=65	Credit
>=50	Pass
<50	Fail

b) Explain each of the following as used in C programming.   [4Marks]
   i. Call by value
   ii. Call by reference

c) Distinguish between the **while** and **do while** control structures.   [2 marks]

c) Study the program below and answer the questions that follow:

```
1.  #include<stdio.h>
2.  Int main( )
3.  {
4.  Int a,b,c;
5.  Printf("enter value of a:");
6.  Scanf("%d",&a);
7.  Printf("enter value of b:");
8.  Scanf("%d",&b);
9.  Printf("enter value of c:");
10. Scanf("%d",&c)
11. Return 0;
12. }
```

Explain the function of line 1,3,4,5 and 6. [5 marks]

c) The following program has a problem. When written in your editor and compiled. Which lines will generate an error message? And how can we correct it? [3marks]

```
#include <stdio.h>
main( );
{
    printf( "Hello !" );
    printf( "You\'ll find it!\n" );
    return 0;
};
```

QUESTION FIVE [20marks]

a) List and explain all the parts included in a function definition in a C programming language   [4 Marks]

b) Write a c program that uses a recursion to compute the factorial of a number which is entered by the user. [6 marks]

c) White a program that determines the average of even numbers between 1 and 20. The program should display all the even numbers and the average.   [6 marks]

d) Using an illustration differentiate between local and global variables   [4 marks]