MERU UNIVERSITY OF SCIENCE AND TECHNOLOGY

P.O. Box 972-60200 – Meru-Kenya.
Tel: +254(0) 799 529 958, +254(0) 799 529 959, +254 (0)712 524 293
Website: www.must.ac.ke Email: info@mucst.ac.ke

UNIVERSITY EXAMINATIONS 2023/2024

FIRST YEAR, SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF EDUCATION TECHNOLOGY IN MECHANICAL ENGINEERING, BACHELOR OF EDUCATION TECHNOLOGY IN ELECTRICAL AND ELECTRONIC ENGINEERING, BACHELOR OF TECHNOLOGY IN ELECTRICAL AND ELECTRONIC ENGINEERING, BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING, BACHELOR OF TECHNOLOGY IN CIVIL ENGINEERING AND BACHELOR OF SCIENCE IN MATHEMATICS/PHYSICS

CIT 3102: FUNDAMENTALS OF COMPUTER PROGRAMMING

DATE: APRIL 2024 **TIME: 2 HOURS**

INSTRUCTIONS: Answer Question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

a) The following is a program code written in one of the programming languages:

```
LDA 34
ADD #1
STO 34
```

i. Identify the Generation of the programming language (1Mark)

ii. State three benefits of using a language in that Generation (3 Marks)

b) State two examples of third-generation languages (2 Marks)

c) Describe the type of translator required for each of the following programming languages:

i. High-level language (2 Marks)

ii. Assembly language (2 Marks)

d) Given that $a = 8, b = 6\ and\ c = 2$, compute the values of Z in the following C statement (2 Marks)

$$Z = (a\%b) * c + b * c + a;$$

e) Give two reasons why documentation is necessary in programming (2 Marks)

f) Explain #include<stdio.h> as used in C programming. (2 Marks)

g) John is developing a program for his client. Explain three types of errors that he is likely to come across in the program (6 Marks)

h) Distinguish between inbuilt and user-defined functions (4 Marks)

i) Explain two ways of inserting comments in a C program (4 Marks)

QUESTION TWO (20 MARKS)

a) Using suitable examples, differentiate between a local variable and a global variable. (4 Marks)

b) Distinguish between do..while and while loop as applied in C programming language (4 Marks)

c) Write a C program that would prompt a user to enter the number of acres of land to be bought. If the number is greater than five, the price per acre is Kshs. 1.0 million else the price is Kshs. 1.2 million. The program then computes and displays the total cost of the land purchased. (6 Marks)

d) The table below shows the details of tax relief as determined by a certain tax firm. Use it to answer the question that follows

Category name	Amount insured	Tax relief
Casual	1,000,000	5%
Contract	2,000,000	10%
Permanent	1,000,000	20%

The firm intends to computerize the process of determining the tax relief. Write a pseudocode that would be used by the programmer to meet the firm's requirement (6 Marks)

QUESTION THREE (20 MARKS)

a) Write a C program that accepts two strings of not more than 30 characters. The program should then join the two string values and display the output (5 Marks)

b) State a program development phase where each of the following activities may be performed (5 Marks)

i). Writing the actual program

ii). Stating the requirements of the program to be developed

iii). Enhancing the operation of the program

iv). Checking if the program meets its requirement specifications

v). Drawing a flowchart to show the logic of a program

c) Write a program in C that uses a do...while loop to display all even numbers between 20 and 40 (5 Marks)

d) Programming students scored the following marks in their CAT; 11, 09, 20, 22, 24, 28. Using C, input the scores into an array and compute the average mark (5 Marks)

QUESTION FOUR (20 MARKS)

a) Outline three places in a C program where a variable can be declared (3 Marks)

b) Outline the function of each of the following statements in a C program (6 Marks)

i). int Mult(int x, in y)

ii). scanf("%d%d", &a,&b)

iii). printf("%f", t[i])

c) The volume of a sphere is given by $V = \frac{4}{3}\ x\ \pi\ x\ r^3$, where V is the volume and r is the radius. Write a C program that would compute and display the volume of a sphere with a radius 20cm. (5 Marks)

d) Write a program in C that prompts a user to enter a number between zero and three. The program then uses a function to print out the following: If the number is 0, it prints Zero; If 1,

it prints One; If 2, it prints Two; If 3, it prints Three. Otherwise, it prints Unknown. Use *switch* (6 Marks)

QUESTION FIVE (20 MARKS)

a) Describe the term white space as used in C programming (2 Marks)

b) Using the for loop, write a program in C that computes the factorial of the numbers from 1 to 7 (6 Marks)

c) Identify the errors in the following program (6 Marks)

```
#include<stdioh>
main {
int a, b, d, x, y,z;
a=9
b = 12; c = 3;
x = a-b\3 +c*2 -1;
y = a-b/ (3+c) * (2-1);
z = a)- (b /(3+c) * 2) -1)
printf("x = % f\n", x);
printf("y = %d \n", y);
printf(z = %d \n", z);
}
```

d) With the aid of a diagram in each case, describe the following as applied in flowcharts: (6 Marks)

i). Process;

ii). Input/Output;

iii). Decision