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KIRIRI WOMENS' UNIVERSITY OF SCIENCE AND TECHNOLOGY  
UNIVERSITY EXAMINATIONS, 2022/2023 ACADEMIC YEAR  
END OF SEMESTER EXAMINATIONS  
FOR THE DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY  
**DIT 1002: STRUCTURED PROGRAMMING**

Date:  
Time:.

**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS**

**QUESTIONS ONE (30 MARKS)**

- a) Define the following terms as used in programming:
- i) Programming language [2 marks]
  - ii) Object code [2 marks]
  - iii) Escape sequence [2 marks]
- b) Differentiate between local variable and global variable.
- c) Explain any THREE advantages of low level programming language. [6 marks]
- d) Discuss the main features of modular programming highlighting its key advantages. [6 marks]
- e) Draw a flowchart for a program that calculates the area and the perimeter of a circle then displays results on the screen. [4 marks]
- f) Write the codes for the above program in C language. [4 marks]
- g) Suggest, with examples two ways in which constant values can be used in C expression statements. [4 marks]

**QUESTION TWO (20 MARKS)**

- a) Draw a flowchart of a program that will display the words adult, teen or child based on the age. If age is below 13 years, **child**, age is between 13 and 19, **teen** else **adult**. [5 marks]

b) Write the C program code that can be used to develop the above (a) program. [7 marks]

c) Discuss the main steps of program development. [8 marks]

### **QUESTION THREE (20 MARKS)**

a) Define the term Algorithm. [2 marks]

b) State FOUR examples of reserved words used in C programming. [4 marks]

c) Explain any four rules of naming variables in C language. [8 marks]

d) Language processor are key to all programming languages except the machine language.

Explain the main types of language translators. [6 marks]

### **QUESTION FOUR (20 MARKS)**

a) Explain the main advantages of C programming language over other Languages. [6 marks]

b) From the following program, suggest the syntax and logical errors that may have been made. [6 marks]

```
#include<stdio.h>
main()
{
int , int n2, n3;
n = 5;
n2 = n *n
n3 = n2 * n2;
printf(" n = %d, n squared = %d, n cubed = %d \ n", n, n2, n3);
return 0;
}
```

Write a C program using the while loop that displays numbers 1 to 10 on the screen. [8 marks]

### **QUESTION FIVE (20 MARKS)**

a) Explain the importance of the following functions in a C program.

i. Printf() [2 marks]

ii. Scanf() [2 marks]

b) C is both 'portable' and 'efficient'. Explain. [6 marks]

c) The roots of a quadratic equation  $ax^2 + bx + c = 0$  can be evaluated as:

$$x_1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

$$x_2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a}$$

where a, b ,c are double type variables and  $b^2 = b * b$  ,  $4ac = 4 * a * c$  ,  $2a = 2 * a$ .

Write a program that calculates the two roots  $x_1$ ,  $x_2$  with double precision, and displays the roots on the screen. [10 marks]