THE CATHOLIC UNIVERSITY OF EASTERN AFRICA

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MAIN EXAMINATION

JANUARY – APRIL 2020 TRIMESTER

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER AND LIBRARY SCIENCE

REGULAR PROGRAMME

CMT 110: PROGRAMMING METHODOLOGY

Date: APRIL 2020	**Duration: 2 Hours**
INSTRUCTIONS: Answer Question ONE and any other TWO Questions	

Q1. a) Define the following terms explaining their meaning

i) Comment **(1 Mark)**

ii) Flowchart **(1 Mark)**

iii) Function **(1 Mark)**

iv) Pseudocode **(1 Mark)**

v) Algorithm **(1 Mark)**

b) C Language is widely used to develop systems that demand performance, mention **four** of such systems **(2 Marks)**

c) Explain the difference between a compiler and an interpreter **(2 Marks)**

d) Explain the below statement as used in C programming **(2 Marks)**
#include <stdio.h>

e) C provides **three** types of selection structures in the form of statements. State and briefly explain each of the structures **(3 Marks)**

f) Giving an example of a High Level Language, explain the difference between a High Level Language and Machine Language **(3 Marks)**

g) Identify and explain any **four** relational operators used in C-Language **(4 Marks)**

h) Draw the flow chart for a program that prompts the user to enter CAT marks and Exam marks. The program then sums the two marks to make the Final marks. Then it tests if the Final mark is more than 40 it displays "Passed" else it displays "Failed" **(4 Marks)**

i) Write a C program that prompts the user to enter two integer variables and sums the two integers then displays the sum. **(5 Marks)**

Q2. a) Identify and correct the errors in each of the following statements as used in C-Language **(4 Marks)**

(i) printf (" The value is %d\n ", &number);

(ii) scanf("%d%d", &number1, number2);

(iii)
```
if (c<7);
    {
       printf ( "C is less than 7\n" );
    }
```

(iv)
```
if (c => 7)
    {
       printf ( "C is greater than or equal to 7\n" );
    }
```

b) Write the programmic form of the following:

(i) $x = 2q^2 + r$ **(2 Marks)**

(ii) $k=sin2\ x + cos2\ x$ **(2 Marks)**

c) Write a C program that accepts and picks the biggest out of **three** integer values. Use a **user-defined function** in your program **(8 Marks)**

d) Explain the term ***scope of an identifier***. State and explain any **three** identifier scopes as used in C-Language. **(4 Marks)**

Q3. a) Using the **while Loop**, write a program in C language that prompts the user to enter **ten** grades of integer type. Then calculates and displays the average of the grades. Use a counter with the while Loop. **(6 Marks)**

b) Using a **case selection statement**, write a program in C language that prompts the user to enter a department number between 1 and 4. Then from the below information, the program should display the supervisor for each department **(6 Marks)**

Department 1 – Jane Clark
Department 2 – Marty Baines
Department 3 – Drew Johnson

c) Write a program in C-Language that sums up numbers entered by the users until a zero is entered. Use the **do…while loop**. **(6 Marks)**

d) Explain any **two** basic data types in C-Language **(2 Marks)**

Q4. a) Write a C-Language program that uses a **user defined function** called **square** to calculate and print the squares of the integers from 1 to 10

(6 Marks)

b) Write a C-Language program that accepts a sentence and converts the same to **upper** case **(6 Marks)**

c) Explain any **three** built-in functions used in C-Language **(6 Marks)**

d) Provide any **two** rules you will use when forming variable names in C-Language **(2 Marks)**

Q5. a) (i) Write a brief note on structures in C-Language **(3 Marks)**

(iii) Define in C-Language a structure called **employee** which holds **name**, **id no**. and **department** **(3 Marks)**

b) Explain the following as used in C- Language

(i) Array **(2 Marks)**

(ii) math.h **(2 Marks)**

(iii) scanf() **(2 Marks)**

(iv) string.h **(2 Marks)**

c) Write a C-Language program that initializes to zero all the elements of an 5 element array of type integer **(6 Marks)**

END