CHUKA  **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF BACHELOR OF EDUCATION (ARTS AND SCIENCE)

COSC 107: INTRODUCTION TO COMPUTER PROGRAMMING AND PROBLEM SOLVING

STREAMS: B.ED (ARTS & SC.) (Y4S2) **TIME: 2 HOURS**

DAY/DATE: MONDAY 14/04/2025 **8.30 A.M. – 10.30 A.M.**

INSTRUCTIONS

- Answer question 1 in section A and any other **TWO** from section B
- Marks are awarded for clear and concise answers
- Note that only Question **ONE** (Section A) and the first **TWO** attempted questions in section B will be marked.

SECTION A-COMPULSORY

QUESTION ONE (30 MARKS)

a) Distinguish between low-level and high-level programming languages **[4 marks]**

b) Illustrate the main difference between the syntax of *while* and *do-while* loops in C **[4 marks]**

c) Highlight the advantages of using functions when developing computer programs **[4 marks]**

d) Describe any **THREE** datatypes used in C programming language **[3 marks]**

e) Discuss the difference between a variable and a keyword **[4 marks]**

f) Write a function in C that returns the sum of the following numbers passed as separate arguments: 3000, 78443, 89889, 4000. **[4 marks]**

g) How does the design phase, including algorithm and flowchart creation, assist in solving a problem? **[5 marks]**

h) Explain the purpose of declaring variables in a computer program **[2 marks]**

SECTION B-Answer any TWO questions from this section

QUESTION TWO (20 MARKS)

(a)Describe **THREE** qualities of a good algorithm **[3 marks]**

(b)Describe two decision structures in C **[4 marks]**

(c)Use the program below to answer the questions that follow:

```
#include
void Main
{
float Pi=3.142;
float Radius, C, A;
/Calculate the circumference
C=PI*2*r;
/*Calculate the area/
A=Pi*r*r;
printf ("The area is %f", A);
printf ("\n The circumference is %f", C)
}
```

a. Identify any three errors in the program **[3 marks]**

b. Rewrite the program in its correct form **[6 marks]**

c. Evaluate the correct program and discuss its output **[4 marks]**

QUESTION THREE (20 MARKS)

(a)You are required to develop a program to compute average score of a student taking four subjects .The subject exams are marked out of 100 each with CATs contributing 30 marks and final exam contributing 70 marks.

(i) Identify the inputs, outputs and formulae necessary to in solving the problem **[6 Marks]**

(ii) Draw a flow-chart that represents the algorithm to solve the problem **[6 marks]**

(iii) Write a function in C that calculates their average score **[8 marks]**

QUESTION FOUR (20 MARKS)

a) Write a function in C that uses a while loop to continuously receives numbers as it adds them and terminates when the sum is greater than 209 **[8 marks]**

b) Write a program that allows a user to enter different letters of the alphabet but terminates when the letter 'X' is entered on the keyboard **[6 marks]**

c) Write a for-loop code to calculate the sum of odd numbers between 1 and 40 **[6 marks]**

QUESTION FIVE (20 MARKS)

a) Describe the stages involved in software development life-cycle **[8 marks]**

b) Write a function that accepts an integer and returns its next four odd numbers **[6 marks]**

c) Write a function that accepts an array as input and returns the array in reverse **[6 marks]**

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