CHUKA   **UNIVERSITY**

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF DEGREE OF
BACHELOR OF EDUCATION SCIENCE

**COSC 107: INTRODUCTION TO COMPUTER PROGRAMMING AND
         PROBLEM SOLVING**

STREAMS: BSC YIS2   **TIME: 2 HOURS**

DAY/DATE:

INSTRUCTIONS:

1. Answer question 1 in section A and any other **TWO** from section B
2. Marks are awarded for clear and concise answers
3**.** 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)Differentiate between the following terms as used in computer programming.

   (i)High level languages and assembly language   **[4 Marks]**
   (ii)Syntax and logical errors   **[4 Marks]**

(b) While stating the role of an algorithm in computer programming, give **TWO** desirable features of an algorithm.   **[4 Marks]**

(c)Using a diagram, illustrate the five steps of processing a high-level language program.
                                                                          [6 Marks]

(d)Discuss **TWO** decision structures used in C indicating their syntax.   **[4 Marks]**

(e)A program is required to read three numbers from a user and provide a product
of the numbers**.** Design an algorithm in form of a flowchart to solve this problem. **[5 marks]**

(f) Explain **THREE** numeric variable types used in C programming.   **[3 Marks]**

SECTION B-Answer any TWO questions from this section

Question TWO [20 Marks]

(a)Study the program code below and answer the questions that follow.

```
#include <stdio.h>
void Main
{
float Pi=3.142;
float Radius, C, A;
C=Pi*2*r;
A=Pi*r*r;
printf ("The area is %f",A);
printf ("\n The circumference is %f",C)
}
```

(i)Identify atleast 3 errors in the program.   **[3 Marks]**

(ii)What would be the output of the program after correction of the errors. **[2 Marks]**

(iii)Implement this code in a function that is called in the main body.   **[10 Marks]**

(b)While outlining what a reserved word is, explain the use of **THREE** reserved words as used in C programming language.   **[5 marks]**

Question THREE [20 Marks]

(a)A solution is required that accepts **n** user input integers, calculates and outputs their sum and their average.

(i) Identify the inputs and outputs required in order to solve the problem.   **[3 Marks]**

(ii)Identify the computations/processing required in order to solve the problem.
                                                                        [2 Marks]

(iii)Draw a flowchart for solving the problem.   **[7 Marks]**

(iv)Implement the flowchart using C programming language.   **[8 Marks]**

Question FOUR [20 Marks]

Assuming every customer has to buy FOUR items from a grocery whenever he shops. Using an array, a program is required that prompts the cashier to key in the cost of each

item bought by the customer. It then gives the total cost to be paid by every customer. If the customer has bought goods worth Ksh 500 and above it gives a total discount of Ksh 40.

(i)Identify the inputs and outputs required in order to solve the problem.
[3 marks]

(ii)Identify the computations/processing required in order to solve the problem
[2 Marks]

(iii)Identify any constraints or conditions required in order to solve the problem.
[2 Marks]

(iv)Develop an algorithm to solve the problem   **[6 Marks]**

(v)Write a program in C that implements the algorithm   **[7 Marks]**

Question FIVE [20 Marks]

(a) Citing an example in each case, explain TWO reasons for using semicolons in C Programming language.   **[4 marks]**

(b)Using an example in each case, explain TWO logic operators used in C programming
[**4 marks**]

(c)Explain what a high-level programming language is, give **FOUR** examples of such programming languages.   **[4 marks]**

(d)Explain TWO ways of representing comments in C programming.   **[4 marks]**

(e)Explain the term operator precedence and arrange the following operators in bracket from the lowest to the highest precedence (*, %, +).   **[4 marks]**