

CHUKA



UNIVERSITY

**UNIVERSITY EXAMINATIONS**

**FIRST YEAR EXAMINATION FOR THE AWARD OF BACHELOR OF  
EDUCATION SCIENCE [COMPUTER SCIENCE AND MATHEMATICS  
OPTION]**

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

**STREAMS: BSC. COMP. SCI (Y1S2)**

**TIME: 2 HOURS**

**DAY/DATE: MONDAY 22/03/2021**

**2.30 P.M. – 4.30 P.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) Differentiate between the following terms as used in computer programming.
- (i) Reserved word and identifier **[4 marks]**
- (ii) Variable and constant **[4 marks]**
- (b) While stating the role of an algorithm in computer based systems design, give **THREE** of its desirable features **[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 compute their sum and average. Develop an algorithm in form of a flowchart to solve this problem

[4

marks]

- (f) Explain **FOUR data** types used in C programming [4 Marks]

**SECTION B-ANSWER ANY TWO QUESTIONS FROM THIS SECTION**

**QUESTION TWO [20 MARKS]**

- (a) Problem Solving is the process of transforming the description of a problem into the solution of the same problem by using the knowledge of the domain and relying on our ability to select and use appropriate problem solving strategies, tools and techniques. Briefly describe **SIX** steps of problem solving that involves development of a software [12 marks]
- (b) While outlining what a loop is, explain the use of **THREE** loops in C programming language [6 marks]
- (c) State **TWO** way of presenting an algorithm [2 marks]

**QUESTION THREE [20 MARKS]**

- (a) A solution is required that accepts radius of a circle as user input and calculates circumference and area.
- (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]**

A program is required that prompts the cashier to key in the cost of each item bought by the customer and stores each item cost in an array. 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. Assuming every customer has to buy FOUR items from a grocery whenever he shops.

## COSC 107

- (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) Compilation is a key step when writing a computer program. Explain **TWO** reasons for compiling a high level language program **[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) Declare the following variables

- (i) An array to store 10 integers **[2 marks]**

- (ii) A variable to store age in years of form 1 students **[2 marks]**