

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR THE AWARD OF BACHELOR OF SCIENCE IN  
COMPUTER SCIENCE

COSC 104: INTRODUCTION TO PROGRAMMING METHODOLOGIES

STREAMS: BSC (Y2S1) ODEL

TIME: 2 HOURS

DAY/DATE: THURSDAY 22/7/2021

11.30 A.M. – 1.30 P.M.

**INSTRUCTIONS:**

1. Answer question **ONE** in SECTION A and any other **TWO** questions in SECTION B
2. Marks are awarded for clear and concise answers

**SECTION A**

**QUESTION ONE COMPULSORY - (30 MARKS)**

- a) Explain the following terms as used in C programming: (2 marks)
  - i. Variable
  - ii. Constant
- b) Distinguish the following terms: (4 marks)
  - i. Compilation and execution
  - ii. Identifier and variable
- c) Discuss three rules of naming variables (3 marks)
- d) Point out and correct the mistakes in the following variable names (4 marks)
  - i. switch
  - ii. ? name
  - iii. my name
  - iv. void
- e) Write a programming that adds and subtracts two numbers with two decimal points and displays the result. (6 marks)

- f) Part of the program Development Cycle is to TEST and DEBUG the coding created by the programmer. Unfortunately, most programmers assume that both of the terms, are the same but infact they are not. Explain the following terms and their importance in programming.
- i. Test
  - ii. Debug (4 marks)
- g) Briefly describe the stages involved in a systems development cycle, starting with the original identification of the problem by management and ending with a report back on successful (or otherwise) implementation. (7 marks)

**SECTION B: CHOOSE TWO QUESTIONS**

**QUESTION TWO (20 MARKS)**

- a) Distinguish between Local variables and Global variables as used in programming (4 marks)
- b) Using examples, describe the following mathematical operators as used in C programming:
- i. Arithmetic operators
  - ii. Logical operators
  - iii. Relational operators (6 marks)
- c) For a C program to be understood clearly by novice programmers, comments are used among other features.
- i. Explain two roles of commenting when programming in C. (2 marks)
  - ii. Differentiate between the following symbols as used in comments:  
//..... and /\*.....\*/ (2 marks)
- d) Abel wrote the C program below but did not run. Study it and rewrite the correct code by removing the errors (6 marks)

```
#include<stdio.>
void main ()
{
    int a, b, sum, product
    double 8average;
    printf("Enter a value for a\n");
    scanf("%d",a);
    printf("Enter a value for b\n");
    scanf("%d",&c);
    sum = a + b;
    product=a*b;
    average = (double) sum/2;
    printf("\n%d+%d=%d", num1,num2,sum);
    printf("The average is %4.2lf\n");
    return 0;
```

)  
**QUESTION THREE (20 MARKS)**

- a) Clearly explain the following terms: (6 marks)
- i. Linking
  - ii. Data type
  - iii. Operand
- b) CHINA WU-YI Construction Company will pay employees gratuity on termination of the Thika road contract computed as follows:  
gratuity = (basic\_salary x fixed\_rate x months\_worked).
- i) Identify the variables in the problem. (3 marks)
  - ii) Formulate an algorithm that can be used to calculate gratuity. (4 marks)
  - iii) Represent the algorithm b (iii) above using a program flow chart. (3 marks)
  - iv) Write a program using C to implement b (iv) above. (4 marks)

**QUESTION FOUR (20 MARKS)**

- a) The following code fragment is a pseudo-code used to solve a computer problem:
- Declare the variables x, y, z and the result to be of type into (in separate statements).
  - Prompt the user to enter three integers.
  - Read three integers from the keyboard and store them in the variables x, y and z.
  - Compute the product of the three integers contained in variables x, y and z and assign the result to the variable result.
  - Print “the product is ” followed by the value of the variable result
- i) Write a program to implement the above pseudo-code. (4 marks)
  - ii) Use a flowchart to implement the fragment in (ii) above. (4 marks)
- b) Using examples, discuss the three types of control structures as used in C programming language. (6 marks)
- c) Peterson invested Kshs.1000, 000 in savings account yielding 5% interest. Assuming that all interest is left on deposit account, write a program will compute and display the interest after 5 years. (6 marks)

**QUESTION FIVE (20 MARKS)**

- (a) List and explain two disadvantages of using pointers (2 marks)
- (b) Write a C program to find the grade of a score by the user. The program prompts a user to enter a score and then displays the grade. Use the grading system: 100 – 70 A, 69 -60 B, 59 – 50 C, 49 – 40 D, 39 – 0 F. (8 marks)
- (c) A learning institution wishes to develop C/C++/JAVA software system for registering students. The program should prompt the User to enter Marks for 3 Courses undertaken by a student within a particular semester, declare an array structure and to store the above information if the institution would not wish to register more than 100 students in the current academic year. (10 marks)
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