

CHUKA



UNIVERSITY

UNIVERSITY EXAMINATIONS

RESIT/SPECIAL EXAMINATION

**FIRST YEAR SECOND SEMESTER EXAMINATION FOR THE AWARD OF
DEGREE OF BACHELOR OF APPLIED COMPUTER SCIENCE**

ACSC 122: INTRODUCTION TO STRUCTURAL PROGRAMMING USING C

STREAMS:

TIME: 2 HOURS

DAY/DATE: WEDNESDAY 12/09/2018

8.30 A.M. – 10.30 A.M.

CANDIDATE INSTRUCTIONS

- Answer **all questions** in section A and any other **two questions** from section B.
- No Reference Material is allowed in the exam Room.
- All Mobile phones should be switched off in the exam room.
- Write legibly.

SECTION A (COMPULSORY)

QUESTION 1 (COMPULSORY) [30 MARKS]

- a) Explain FOUR data types used in C programming language (4marks)
- b) Using an example in each case, explain TWO ways of declaring constants in C. (3marks)
- c) Outline the importance of the following data structures
 - i) Arrays
 - ii) Stacks (4marks)

- d) Write the output of the following program

```
#include <stdio.h>
int main ()
{
    int i, j;
    for(i=50; i<75; i++) {
        for(j=2; j <= (i/j); j++)
            if(!(i%j)) break; // if factor found, not prime
```

```

        if(j > (i/j)) printf("%d is prime\n", i);
    }
    Return 0;
}

```

(5marks)

e) Write a C code that implements any TWO relational operators (4marks)

f) Write a C program that is going to write only the values divisible by 3 in descending order, between 1 and 100. (5marks)

g) If int c is 30 and int m is 15. Write the values of c and m after the following lines of code.

```

c+=20;
m/=10;

```

(2marks)

h) Using int c=20; Differentiate between Lvalues and Rvalues in C. (3marks)

SECTION B (Answer **two question** from this section)

QUESTION 2 [20 MARKS]

a) Write a program that implements a pointer. Then give the expected output and its benefit in computing. (8marks)

b) Explain the use of FIVE reserved words In C programming language. (5 marks)

c) Write a C program to multiply 2x2matrix with another 2x2matrix. (7marks)

QUESTION 3 [20 MARKS]

a) Explain FIVE basic operations that could be performed by an array (5marks)

b) Write a program that prompts a user to enter the diameter of a circle. It then returns the area of the circle ($\text{area} = \text{pie} \times \text{radius}^2$) and the circumference of the circle ($\text{circumference} = \text{pie} \times \text{diameter}$). It should not accept a negative diameter, and gives the answers in 2decimal points. (8 marks)

- c) With the help of a C program and a solution it would provide, explain THREE logic operators used in C programming.
(7marks)

QUESTION 4 [20 MARKS]

- a) Explain FOUR sorting algorithms
(8marks)
- b) Using function(s) write a C program that is going to prompt a user to enter the length and width of a rectangle, both with decimal points. It then returns the circumference, and area of the rectangle.
(8marks)
- c) Draw a flow chart to illustrate question 4 (b) above
(4marks)

QUESTION 5 [20 MARKS]

- a) Explain FOUR parts of a function
(4marks)
- b) With reference to SWITCH statements in C programming language, answer the following questions.
- i) Explain TWO benefits of SWITCH statements.
(2marks)
 - ii) Explain THREE rules in writing switch statements
(3marks)
 - iii) Write the syntax of switch statement
(3marks)
- c) Write a program using WHILE loop, that writes numbers 20 to 40 inclusively each on its own line. It should skip number 16, repeats number 26 four times, and add 2 to number 36 to have two number 38.
(8 marks)
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