CHUKA   UNIVERSITY

UNIVERSITY EXAMINATIONS

EXAMINATION FOR BACHELOR OF SCIENCE IN COMPUTER SCIENCE

COSC 221: STRUCTURED PROGRAMMING

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 ONE AND ANY OTHER TWO QUESTIONS

QUESTION ONE (30 MARKS)

(a) Explain the differences between the following two types of functions in C

   programming: (4 marks)

   (i) Standard library functions

   (ii) User-defined functions.

(b) With an aid of an example in each case state two types of comments applied in C

   Programming.   (3 marks)

(c) Briefly explain **three** advantages of **User-defined** functions.   (3 marks)

(d) Differentiate between the following decision loops: (4 marks)

   (i) while loop

   (ii) do – while loop

(e) Explain what a pointer is as used in C language.   (2 marks)

(f) Explain the differences between the following two keywords: ***break*** and ***continue.*** (2 marks)

(g) Explain four ways that can be used to initialize an array.   (4 marks)

(h) Explain **four** differences between **switch case** and **else if** ladder in C language   (4 marks)

(i) Using C language, write a program that would test and display if an integer entered by

   the user is ODD or EVEN.   (4 marks)

QUESTION TWO (20 MARKS)

(a) Explain two benefits of SWITCH statements. (2 marks)

(b) Based on file concepts, explain the differences between the following two terms: (4 marks)

    (i) fclose(a)

    (ii) fcloseall()

(c) Write a program using nested **if-else** to check if a number entered is Positive or Negative.

(6 marks)

(d) Write a program to calculate the sum of **10** numbers entered from the keyboard. Negative numbers will not be included in the calculation. (*Use a for-loop*) (8 marks)

QUESTION THREE (20 MARKS)

(a) i) Describe an array as applied C programming. (2 marks)

    ii) How are elements of a given array accessed? (4 marks)

(b) Write a program using C language that would be used to show the net pay of an employee based on the following information: **Nhif** = ks. 200.50 and **Tax** is 30% of the gross pay. Restrict the net pay to two places of decimal. (6 marks)

(c) Write a program that allows the user to capture the following numbers and store them an array. the program should then compute the total of all the numbers and output the total.

(8 Marks)

8990

567.9

45.45

2345

6777

QUESTION FOUR (20 MARKS)

(a) Explain the importance of using comments in C programming. (2 marks)

(b) Explain the differences between *Formal parameters* and *Actual parameters.* (4 marks)

(c) Write a C program that will generate the following output. Use while loop. (6 Marks)

```
*

*       *

*       *       *

*       *       *       *

*       *       *       *       *
```

(d) Using *User defined function*, write a program to add three integer numbers entered by the user. The *main()* function should pass those three numbers to a function called *addNumbers()* that is going to add the three numbers together and return the result to the *main()* function to display on the screen. (8 marks)

QUESTION FIVE (20 MARKS)

(a) Using a pointer, write a program in C that would print out the values of **two** declared integer variables along with their addresses. (4 Marks)

(b) Differentiate between singly and doubly linked lists? (4 Marks)

(c) Write a **C** code to show how to find the memory size of a given integer variable. (6 Marks)

(d) Write a program in C whereby the *main()* function would call another function to print/display exactly the following output: (6 Marks)

Hello!

My name is Thomas

Welcome to C programming