MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SIT122: STRUCTURED PROGRAMMING

DATE: 15/12/2020 **TIME: 8.30-10.30 AM**

INSTRUCTIONS

Answer question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

(a) i Define the term *spaghetti programming* as used in computer programming. (2 marks)

ii Explain **three** advantages of modular programming. (6 marks)

b) Peter, an Information Technology student wrote an algorithm for a program. Explain **three** characteristics of algorithms he could have considered. (6 marks)

c) i A student declared a variable in a program, outline **four** rules he could have observed. (4 marks)

ii Citing an example in each case, explain **two** methods of passing parameters in a structured program. (6 marks)

d) i Define the term *recursive function*. (2 marks)

ii Write a program in C language that would prompt a user to enter an integer. The program then checks whether the integer entered in odd or not and outputs the result. (4 marks)

QUESTION TWO (20 MARKS)

a) i Explain the term *data structure* as used in programming. (2 marks)

ii State a possible cause of each of the following types of errors in programming (2 marks)

I. Syntax error;

II. Runtime error.

b) i Computer programming has evolved over time. Discuss **two** paradigms that have been part of this evolution. (4 marks)

ii Outline **two** ways of incorporating comments in a C language program. (2 marks)

c) i Distinguish between *entry-controlled* and *exit-controlled* loops. (4 marks)

ii Write a program in C language that would accept monetary value in Kenya Shillings. The program then converts the value entered into US dollars through a function and outputs the result. (1 US dollar = 105 KES). (6 marks)

QUESTION THREE (20 MARKS)

a) Define each of the following terms as used in structured programming.

i. Reserved word; (2 marks)

ii. Portability. (2 marks)

b) Explain each of the following methods of program testing: (6 marks)

i. Integration testing;

ii. Stress testing;

iii. Unit testing.

c) A student created a program that generated the following output.

12 12 12

11 11

10

Write a program in C language that would generate the output. (4 marks)

d) i Define the term *function call* as used in programming. (2 marks)

ii A program accepts two integers; it checks which of the two integers is larger than the other and outputs the result. Draw a flow chart to represent the program logic. (4 marks)

QUESTION FOUR (20 MARKS)

a) Outline **three** qualities of a good program. (3 marks)

b) A student used arithmetic operators in a program. Citing **two** examples in each case, describe three such operators. (6 marks)

c) The following is a C language program. Use it to answer the question that follows.

```
#include <stdio.h>
int main ()
{
int Marks[ 4 ]={60,70,80,90};
int i,j;
for (j = 3; j >= 0; j-- )
{
printf("Element[%d] = %d\n", j, Marks[j] );
}
return 0;
}
```

Interpret the program line by line. (5 marks)

d) James intends to write a program that would compute the average of integers between 10 and 50. Write an algorithm that could be used to design the program. Use *while* loop. (6 marks)

QUESTION FIVE (20 MARKS)

a) State **four** string related functions available in C programming language. (4 marks)

b) Distinguish between *top-down* and *bottom-up* approach to programming (4 marks)

c) Explain **three** file access methods used in structured programming. (6 marks)

d) Table 1 shows the criteria used by a student funding board to allocate loans to applicants. Use it to answer the question that follows.

Evaluation Result	**Amount Approved**
1	60,000
2	50,000
3	40,000
4	30,000
Default	25,000

Table 1

Write a program in C language that would prompt a user to enter the evaluation result. The program then outputs the amount approved. Use *switch* statement. (6 marks)