MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR SECOND TERM EXAMINATION FOR

CERTIFICATE IN INFORMATION COMMUNICATION TECHNOLOGY

STRUCTURED PROGRAMMING

DATE: 3/6/2021 **TIME: 8.30-11.30 AM**

INSTRUCTIONS

Answer question one and any other two question

QUESTION ONE

a) State the *differences* between the following terms.

i. Syntax and source code.

ii. Variable and Constant.

iii. Compiler and Interpreter

iv. High level languages and Low-level languages. (8 marks)

b) Explain any **three** programming tools that can be used during program development (6 marks)

c) Write a C program that will accept **two** values through the keyboard and calculate their product. (4 marks)

d) Mary went through a C program and met the **&** sign in the scanf statement. *Explain* to her it's purpose. (2 marks)

QUESTION TWO

a) Constants in C programming can be declared using two methods. Using an example explain the two methods (4 marks)

b) State the reasons why the following identifiers are *invalid*

i. Value$Sum

ii. Exit Flag

iii. 3lotsofmoney

iv. Char (4 marks)

c) Write a C Program that will accept the *radius* of a circle and then calculate the *area* and the *perimeter* of a circle. (5 marks)

d) Implement a *program* that will accept three values through the keyboard, the program should the output the largest number among the three (7 marks)

QUESTION THREE

a) Explain the purpose of **#** sign in the include statement in C programming. (2 marks)

b) Giving an example, explain the *conditional operator* (4 marks)

c) Write a C program that will printout numbers *1 to 10* use the for() loop (4 marks)

d) Explain the different *types* of *test data* as used in program testing (4 marks)

e) Write a C program that will accept the item code of a product and display the respective product name using the table below. Use the *if* statement.

Code	**Item**
A	Pencil
B	Book
C	Pen
D	Rubber

(6 marks)

QUESTION FOUR

a) Explain the meaning of *control flow* as used in C programming. (2 marks)

b) Table 1 shows the main menu of a management information system. Use it to answer the question that follows.

Option	Menu Activity
1	Capture a New Student
2	Edit Record
3	Check Balance
	Close Record

Table 1

Write a C program that would prompt a user to enter an option. The program Should then outputs the menu activity. Use the *switch..case* statement (6 marks)

c) Explain any **four** types of maintenance done on a computer program. (4 marks)

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

```
main()
{
        int a,b,c,y;
        b=++a;
        c=b++;
        y=b+c;
}
```

Give that the value of a is 6, evaluate the value for y. (4 marks)

e) Explain any **four** benefits of using functions in a program (4 marks)

QUESTION FIVE

a) Using appropriate examples, illustrate the **two** types of *comments* used in C (2 marks)

b) Using a function, Write a C program that will accept a value and then, calculate the factorial of that value. (6 marks)

c) Write a C program that will generate all the *even* numbers in the range **50 to 100.** Use the while loop and the if statement (6 marks)

d) Ufanisi Company limited uses the following information to compute its employees net pay,

Rate of pay= Ksh 1000 per hour

Rate of taxation 11%

Write a C program that accepts an employee's name and number of hours worked then computes the net pay and outputs the name, hours worked, gross pay and net pay

Hint:

Gross pay= hours worked *rate of pay

Taxation = gross pay * taxation

Net pay= gross pay – taxation (6 marks)

QUESTION SIX

a) Describe the meaning of the term *data type* as used in C programming. (2 marks)

b) Explain any **three** C programming variable Formatters. (6 marks)

c) State the difference between the following expressions

i. =

ii. = = (2 marks)

d) Explain the differences between the following terms

i. White box testing and Black box testing

ii. Curative maintenance and adaptive maintenance

iii. Object code and source code

iv. System analyst and Programmer (8 marks)

e) List any **two** examples of programming languages under the fifth Computer Language generations (2 marks)

QUESTION SEVEN

a) Write a c program that will accept the first character of your gender, the program should the print a message indicating if you are male or female. **NB** the program should take care of uppercase and lower case characters. (6 marks)

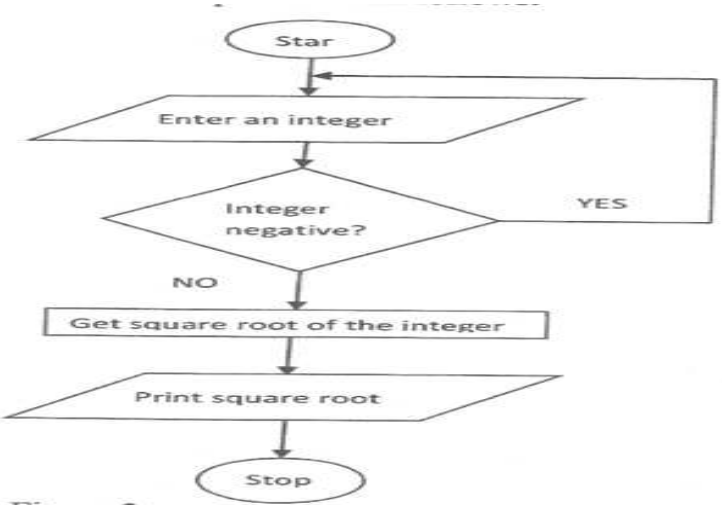
b) Write a Cprogram that will print out all the even numbers from 1 to 50. Use the *for loop* (6 marks)

c) State the differences between *if statement* and the *multiple if statement* (4 marks)

d) Explain any four rules for creating identifiers (4 marks)

QUESTION EIGHT

a) Figure shows a program flowchart used to solve a mathematical problem. Use it to answer the question that follows



Write a C program to implement the program logic (6 marks)

b) Janet, a computer programmer intends to create a program using C programming language. State the program development stage in which she could

i. Create flow chart

ii. Choose the identifiers

iii. Check whether the program is giving the desired results

iv. Adjust the program to meet new demands (4 marks)

c) The following are identifiers used in c programming language during program writing. *Myval, const, integer and switch*

Citing a reason in each case, state whether these identifiers are valid or not (4 marks)

d) A newly constructed computer lab is 15 meters long and 10 meters wide. The lab is to be fitted with floor tiles. Write a Pascal program that will prompt a user to enter the length and width of the lab. The program then computes the number of tiles required. One tile has an area of $0.36m^2$ (6 marks)