



MACHAKOS UNIVERSITY

University Examinations for 2020/2021

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SIT 122/SMA 191: STRUCTURED PROGRAMMING

DATE: 26/3/2021

TIME: 2.00-4.00 PM

INSTRUCTIONS: Answer question one and any other two questions

QUESTION ONE (30 MARKS)

- a) State the *differences* between the following terms.
- i. Variable and Constant.
 - ii. Operator and Operand.
 - iii. Union and Structure
 - iv. Selection and Iteration. (8 marks)
- b) Explain any four benefits of using functions in a program (4 marks)
- c) Using Explain the different types of parameters. (4 marks)
- d) Write a C program that accepts two values through the keyboard. The program should use two functions, one for calculating the product of the two values and another one for calculating the difference between the two values. Demonstrate how the two functions are called in the main function (7 marks)
- e) Using appropriate examples illustrate the **two** types of *comments* used in C (4 marks)
- f) Outline any three rules that must be followed when creating an identifier (3 marks)

QUESTION TWO (20 MARKS)

- a) Using flowcharts, explain the differences between while loop and the do...while Loop (6 marks)
- b) Write a C program that will generate all the *even* numbers in the range **50 to 100**. Use the for loop and the if statement (6 marks)
- c) 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;
}
```

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

- d) State the differences between *continue* and *break* as used in C programming. (4 marks)

QUESTION THREE (20 MARKS)

- a) State the reasons why the following identifiers are *invalid*
- value\$sum
 - exit flag
 - 3lotsofmoney
 - char
- (4 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 the different an ordinary Union and anonymous Union. (2 marks)
- c) Write a C program that will accept a value and then using a function, calculate the factorial of that number. (6 marks)
- d) Define the term variable (2 marks)

QUESTION FOUR (20 MARKS)

- a) Implement a *structure* with the following *attributes*: employee name, employee number, location and address. Declare an array of **6** employees then read in their values and display them. (7 marks)

- b) 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 (5 marks)

- c) Distinguish between *or* and *not* logical operators. (2 marks)
- d) The following is a C program. Use it to answer the question that follows

```
#include<iostream.h>
```

```
{
```

```
    Interger I, j, y;
```

```
    For(i=1; i<n; i++)
```

```
        Y:=i*y;
```

```
}
```

Identify **three** errors in the program (3 marks)

- e) Explain any **three** C programming variable Formatters. (3 marks)

QUESTION FIVE (20 MARKS)

- a) Write a C program that will accept two names through the keyboard and then print them out (4 marks)
- b) Write a C program that will print out a mathematical table for 1 to 10 (7 marks)
- c) The following is a C program. Use it to answer the question that follows

```
#include<iostream.h>
{
    Interger I, j, y;
    for(i=1; i<n; i++)
        Y:=i*y;
}
```

Identify **three** errors in the program (3 marks)

- d) Write a C Program that will print out the following pattern.

5 5 5 5 5

4 4 4 4

3 3 3

2 2

1

(6 marks)