



MACHAKOS UNIVERSITY

University Examinations for 2022/2023

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF COMMERCE

BMS 201: COMPUTER PROGRAMMING.

DATE:

TIME:

INSTRUCTIONS

Answer Question ONE and other TWO Questions

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) Outline two qualities of a good algorithm. (2 marks)
- b) Distinguish between technical and user documentation of a program. (2 marks)
- c) Wakahare, a programmer would like to declare variables.
 - I. Outline two reasons for declaring variables in a program. (2 marks)
 - II. State two rules that he followed in declaring variables. (2 marks)
- d) Given that x is a variable in C program that stores a numeric value, distinguish between $x++$ and $sum+=x$ as used in the program operations. (4 marks)
- e) Using a flow diagram explain the function of the following key words as used in C program:
 - (i) Continue
 - (ii) Break (4 marks)
- g) A program is required to prompt a user to enter two non-zero integers. The program then checks and outputs the larger integer.
 - i. Write a pseudo code and draw the flowchart to represent the logic. (4 marks)
 - ii. Write a program in C programming language to implement the logic. (5 marks)
- h) A newly established bank converts Kenya shillings to US dollar at the rate of 1US dollar=106 Kenya shillings. Write a program in C programming language that prompts a user to enter the currency either Ksh or USD. The program then outputs the equivalent amount. (5 marks)

QUESTION TWO (20 MARKS)

- a) Outline two advantages of Structured programming languages. (2 marks)
- b) Explain the following operators as used in C language giving examples. (6 marks)
- i) Relational operators
 - ii) Arithmetic operators
 - iii) Logical operators
- c) An electric motor rotates 1000 times in a minute. Every time it rotates it moves a robot 2cm from its current location. Write a c program that will show distance in M that the robot will have covered one hour after the motor started rotating. (5 marks)
- d) A company requires a program to enter employee name, hours worked and rate per hour of an employee then calculate basic pay= hours worked multiplied with rate per hour. Tax is calculated on basic pay as follows:

Basic pay	Tax
Over 50000	20% of basic pay
Between 20000 and 50000	10% of basic pay
Below 20000	No discount

Write a C program that will enable the user to enter the above details and calculate basic pay, tax and net pay = basic pay – tax. (7 marks)

QUESTION THREE (20 MARKS)

- a) Define the following words as used in C programming language giving relevant examples in each. i) Reserved Word ii) Identifier (4 marks)
- b) Outline any four benefits of functions in a computer program. (4 marks)
- c) Differentiate r,w,a as used in C file handling. (3 marks)
- d) Write a C program that accepts two numbers and operator (+,-,/,*, +=) computes the result depending on the operator entered, and then output the numbers, operator and the result. (6 marks)

- e) Rewrite the following while loop using a for loop. (3 marks)

```
int i=1;
while(i<=10){
if(i<8&& i!=2||i%4!=0)
printf("%d",i--);
i++
}
```

QUESTION FOUR (20 MARKS)

- a) Mahungu would like to develop a system using one of the programming languages. Outline three factors that he should consider when selecting the appropriate language. (3 marks)
- b) Using syntax differentiate between pointers and structures in C Programming. (4 marks)
- c) Write a C program that prompts you to specify the number of Marks score to enter in an array called DEC22. The program should read all the number of marks specified, calculates the average of the entered integers and displays the results together with all entered elements in reverse. (7 marks)
- d) Write a C program to convert temperatures to and from Celsius, Fahrenheit. Use the provided formula below. (6 marks)

$$\begin{aligned}^{\circ}\text{C} &= \frac{5}{9} (^{\circ}\text{F} - 32) \\^{\circ}\text{F} &= \frac{9}{5} ^{\circ}\text{C} + 32\end{aligned}$$

QUESTION FIVE: (20 MARKS)

- a) Outline differences between beta and alpha testing. (2 marks)
- b) List 3 types of language translators. (3 marks)
- c) Give three types of loops used in programming using the syntax or flowcharts. (3 marks)
- d) C has various standard data types that are used to define the operations possible on them and the storage method for each of them. Explain three data types used in C. (6 marks)

- e) Machakos University has hired you to write a program that will help implement a grading system for students. The examination department has provided you with the rules for grading as shown in the table below. Write a C program to help implement the grading system using the table given below. (6 marks)

Grades	Score
A	70-100
B	60-69
C	50-59
D	40-49
E(Fail)	Below 39