



MACHAKOS UNIVERSITY

University Examinations for 2021/2022 Academic year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (CLOUD COMPUTING AND INFORMATION SECURITY)

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SCO 102: INTRODUCTION TO PROGRAMMING

SIT 120/SIT 122: PROGRAMMING METHODOLOGY

DATE: 31/1/2022

TIME: 8.30-10.30 AM

INSTRUCTIONS: Answer Question ONE and any other TWO Questions

QUESTION ONE (30 MARKS) (COMPULSORY)

- a)
 - i) Outline **two** limitations of machine language in program development. (2 marks)
 - ii) Compare *compiler* and *interpreter* as used in programming. (4 marks)
- b) John, a programmer prefers modular methodology when creating a program. Explain **two** reasons that could have led to this preference. (4 marks)
- c)
 - i) Outline **four** rules for naming identifiers in a computer program. (4 marks)
 - ii) Describe **three** unconditional control statements used in C programming language. (6 marks)
- d) Assuming C programming language, evaluate the expression;
$$Y = a + b^2 * c \% 3 - d$$

Given that $a = 10$, $b = 2$, $c = 9$ and $d = 3$. (2 marks)
- e)
 - i) Define a recursive function. (2 marks)
 - ii) Write a program in C language that accepts length and width of a rectangle. The program then uses a function to compute the circumference of the rectangle and display the result. (6 marks)

QUESTION TWO (20 MARKS)

- a) (i) Explain **two** components of a C program structure. (4 marks)
- (ii) Distinguish between *call by value* and *call by reference* as used in programming. (4 marks)
- b) Discuss **three** statements used for looping in a structured programming. (6 marks)
- c) A programmer would like to design a program that accepts CRB status of a borrower and display the corresponding remark based on the following criteria:
- | Status | Remark |
|--------|-----------|
| 1 | Safe |
| 2 | Low risk |
| 3 | High risk |
- Draw a flowchart to represent this program logic. (6 marks)

QUESTION THREE (20 MARKS)

- a) Outline **two** circumstances that necessitate program translation. (2 marks)
- b) Explain **three** approaches used to break down a program into its subprograms. (6 marks)
- c) The following program has errors. Rewrite the program correctly. (4 marks)
- ```
#include<stdio.h>

main()
{
 Int rate, salary, commission;
 Printf(Enter the salary:);
 scantf(salary);
 commision = rate * salary
printf(The commission is:,commission);
getchar()
}
```
- d) i) State the function of each of the following specifiers in C programming language. (2 marks)
- I. `\t`
- II. `\n`
- (ii) Write a program in C language that would prompt a user to enter the marks scored by a student. The program then outputs the corresponding grade. Given that grade A ranges between 80 and 100, B is between 60 and 79, C is 40 to 49 and F is 0 to 39. (6 marks)

#### QUESTION FOUR (20 MARKS)

- a) i) Outline **two** uses of comments in a computer program. (2 marks)
- ii) Explain each of the following types of program testing:
- I. stress testing;
  - II. unit testing;
  - III. integration testing. (6 marks)
- b) Write a pseudocode for a program that could be used to determine whether an integer entered is even or not. (4 marks)
- c) i) Define the term pointer as used in computer programming. (2 marks)
- ii) Write a statement in C language to declare a pointer named value. (2 marks)
- d) Write a program in C language that could be used to generate the following output.
- ```
P    P    P
P    P
P
```
- (4 marks)

QUESTION FIVE (20 MARKS)

- a) Explain **two** ways through which a programmer could improve the efficiency of a program. (4 marks)
- b) John, a programmer at Mashini company created a file using C programming language. Outline **four** file operation functions he could have used. (4 marks)
- c) i) Write the syntax of creating a two-dimensional array. (2 marks)
- ii) Write a program in C language that would accept five integers in an array. The program then outputs the integers in reverse order of entry. (4 marks)
- d) The following table shows the criteria used by a university to admit students for various courses. Use it to answer the question that follows.

Evaluation Result	Course
1	Science
2	Business
3	Humanities
	Social Science

Table 1

Write a program in C language that would prompt a user to enter the evaluation result of a student. The program then outputs the respective course. Use switch statement. (6 marks)