



Machakos University

Supplementary/Special Examination

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

BACHELOR OF SCIENCE (COMPUTER SCIENCE)
BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SCO102: INTRODUCTION TO PROGRAMMING
SIT101: INTRODUCTION TO STRUCTURED PROGRAMMING
SIT106: PROGRAMMING METHODOLOGY

DATE:

Time:

Instructions

*This paper consists of **FIVE** questions.*

*Answer **QUESTION ONE** and other **TWO** questions in this paper.*

Question One

- (a) (i) Define the term *programming translation* as used in computer programming. (2 marks)
- (ii) Compare an *interpreter* and a *compiler* as used in computer programming. (4 marks)
- (b) Tom, a programmer wrote an algorithm for a program. Explain **three** characteristics of algorithms he could have considered. (6 marks)
- (c) (i) During a programming lesson, students incorporated comments in their program.
 - I. Explain the term comment as used in the statement. (2 marks)
 - II. State two ways through which comments are included in a C program. (2 marks)
- (ii) An organization has tasked you with writing a good program for them. Explain **three** qualities you would consider. (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 is even or not and outputs the result. (6 marks)

Question Two

- (a) (i) Outline **two** disadvantages of using machine code when writing a program. (2 marks)
- (ii) The following program segment created by a student has some syntax errors. Use it to answer the question that follows.

```
Include<stdio.h>
int Main ( )
float x, y product
scanf("%d%d\n a, b);
product = x * y;
printf(product);
```

Rewrite the program correctly. (4 marks)

- (b) Computer programming have evolved over time. Discuss **two** paradigms that have been part of this evolution. (4 marks)
- (c) (i) Distinguish between *call by value* and *call by reference* as used in programming. (4 marks)
- (ii) Write a program in C language that would prompt a user to enter distance in meters. The program then converts the distance entered into kilometers through a function and outputs the result. (6 marks)

Question Three

- (a) The following are variable names used by a student in a C language program.

- (i) Try out
- (ii) Mashunjaa_Day
- (iii) StudentDetails
- (iv) with

State the validity of each of the variables giving a reason for your answer. (4 marks)

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

- (i) Integration testing;
- (ii) Stress testing;
- (iii) Unit testing.

- (c) The following is an output from a computer program. Use it to answer the question that follows:

```
5
6    6
7    7    7
```

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

- (a) Outline **three** operations carried out on a queue data structure. (3 marks)
- (b) Write a program in C language that would store five elements in an array and output the elements in reverse order of entry. (6 marks)
- (c) (i) Explain *sentinel value* as used in programming. (2 marks)
- (ii) Distinguish between *conditional* and *unconditional* looping. (4 marks)
- (d) A university has installed a program that allows lecturers to key in marks for students. When a registration number is entered the program checks whether the student has cleared the semester fee. If a student has cleared then the lecturer keys in the marks otherwise a “NOT CLEARED” message is displayed. Write a pseudocode for this scenario. (5 marks)

Question Five

- (a) (i) Define the term *pointer* as used in C language programming. (2 marks)
- (ii) Write a C language statement to declare a pointer to a float variable name *Number* and assign it the memory address 2150. (3 marks)
- (b) (i) Outline the **three** levels of computer programming languages. (3 marks)
- (ii) Explain **three** characteristics of a *fourth-generation* programming language. (6 marks)
- (c) Table 1 shows the approval criteria used by a certain bank. Use it to answer the question that follows.

Evaluation Result	Loan Limit
1	10,000,000
2	5,000,000
3	1,000,000
4	500,000
Default	100,000

Table 1

Write a program in C language that would prompt a user to enter the evaluation result. The program then outputs the loan limit for the applicant. Use switch control structure. (6 marks)