



UNIVERSITY EXAMINATIONS

SECOND SEMESTER 2023/2024 ACADEMIC YEAR

**THIRD YEAR EXAMINATION FOR THE DEGREE OF
BACHELOR OF SCIENCE IN (ICT)**

COMP 325: PRINCIPLES OF PROGRAMMING LANGUAGES

STREAM: R

TIME: 2 HRS

DAY: WEDNESDAY[11.30AM – 1.30PM] DATE: 10/04/2024

THIS QUESTION PAPER CONSISTS OF FOUR (4) PAGES

PLEASE DO NOT OPEN UNTIL THE INVIGILATOR SAYS SO.



Instructions: Answer question one and any other two

Use illustrations where necessary

QUESTION ONE (30 MARKS)

- a) State TWO advantages of implicit type declarations for variables. [2 Marks]
- b) Distinguish between the following terms as applied to computers:
- (i) OOP and Procedural Programming. [2 Marks]
 - (ii) Operands and Operators. [2 Marks]
 - (iii) Source programs and Object programs [2 Marks]
- c) Outline Three benefits of functional programming. [3 Marks]
- d) Explain why we say “HLL Languages are not Processor-specific” [2 Marks]
- e) What are libraries in software programming? [2 Marks]
- f) Distinguish between Operational Semantics and Axiomatic Semantics? [4 Marks]
- g) State Three reasons for the shift from machine language to assembly language. [3 Marks]
- h) Explain two methods for implementing blocks. [4 Marks]
- i) What advantages does inheritance present to a developer during software development? [4 Marks]

QUESTION TWO [20 MARKS]

- a) Write an algorithm which prompts the user to enter the course units and their scores and find the average of the scores? [4 Marks]
- b) You are tasked with developing an exam management system for Laikipia University, explain Four factors that will influence your choice of programming language. [8 Marks]
- c) Abstraction is an important feature that a programming language provides to a developer. What are the advantages of data abstraction. [4 Marks]
- d) Why would you choose Object Oriented Programming approach over Procedural Programming approach? [4 Marks]



QUESTION THREE [20 MARKS]

- a) Write a function/method named `outOfPlace` that when given a nearly-but-not-quite sorted int array returns the number of array elements that are "out of place." An array element is "out of place" if it's larger than the one that immediately follows it. **[5 Marks]**
- b) What is a function and how do they help in programming? **[3 Marks]**
- c) What is printed by the following? **[4 Marks]**
- ```

int x = 0;

for (int i = 0; i < 5; i++) {
 x = x++;

 System.out.print(x);
}

```
- d) What is exception handling? Give two benefits of exception handling during software development. **[4 Marks]**
- e) Discuss four disadvantages of programming languages. **[4 Marks]**

**QUESTION FOUR [20 MARKS]**

- a) You are developing a transport management system and need a variable to hold the passengers' next of kin contact details.
- i) Give two examples of ideal variable names you'd use. **[2 Marks]**
- ii) State Four best practices for naming variables. **[4 Marks]**
- b) Using well labeled illustrations, differentiate between a System Virtual Machine and Process Virtual Machine. **[8 Marks]**
- c) Advantages of using programming languages with built-in Exception Handling? **[4 Marks]**
- d) What is primary task of a Lexical Analyzer? **[2 Marks]**



**QUESTION FIVE [20 MARKS]**

- a) What's the importance of iteration in software development? [2 Marks]
- b) Discuss Six characteristics of a programming language [6 Marks]
- c) What is a Virtual machine and what benefits does it introduce in programming. [4 Marks]
- d) Discuss the Two forms of abstraction. [4 Marks]
- e) Giving an example, differentiate between Compound Assignment Operators and Unary Assignment Operators. [4 Marks]

