



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND  
TECHNOLOGY**

**SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS  
DEPARTMENT OF INFORMATION SYSTEMS AND TECHNOLOGY  
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF  
SCIENCE IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT/  
BACHELOR OF SCIENCE IN SPATIAL PLANNING  
2<sup>ND</sup> YEAR 2<sup>ND</sup> SEMESTER 2024/2025 ACADEMIC YEAR  
MAIN CAMPUS**

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**COURSE CODE: ITB 9210**

**COURSE TITLE: FUNDAMENTALS OF PROGRAMMING**

**EXAM VENUE: STREAM: ICT**

**DATE: 18/4/2025 EXAM SESSION: 9.00-11.00**

**TIME: 2 HOURS**

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**INSTRUCTIONS**

- 1. Answer question one and any other two**
- 2. Phones are not allowed**
- 3. All rough work should be done in the examination booklets**
- 4. Candidates are advised not to write on the question paper**

### QUESTION ONE (30 marks)

a. Define the following terms as used in computer programming.

- i. Compiler (2 marks)
- ii. Interpreter (2 marks)
- iii. Assembler (2 marks)

b. Case Study on Banking System Automation

KCB Bank has been using a legacy system developed in Machine dependent language to handle customer transactions, account management, and loan processing. However, the bank's IT department finds it challenging to quickly generate reports, extract customer insights, and develop new features. To address this, they decide to adopt a High level (SQL) system that allows employees to generate reports using simple queries rather than writing Machine dependent language. This transition significantly reduces development time and allows non-programmers to interact with the system efficiently.

Required:

Using the KCB Bank case study, explain how the transition from Machine dependent language (a 3rd Generation Language - 3GL) to SQL (a 4th Generation Language - 4GL) reflects the key differences between 3GLs and 4GLs. Provide additional examples to support your answer. (10 marks)

c. What is file handling in relation to programming? List 2 popularly used functions in file handling. (4 marks)

d. A program is required to read in three numbers from the user then displays the greatest of the three numbers.

Required:

- i. Draw a flow chart to show the sequence of steps. ( 4 marks)
- ii. Write a program in object oriented programming (Java) or Structured programming (C ) that implements the above algorithm. (6 marks)

### QUESTION TWO (20 marks)

a. Discuss any TWO features of each of the following types of programming languages:

- i. Machine language. ( 2 marks)
- ii. Assembly language. ( 2 marks)
- iii. Structured languages. ( 2 marks)

- b. With the aid of flowchart constructs, describe each of the following control structures: (4 marks) i) Conditional ii) Iteration
- c. List at least 6 reserved words in OOP/ Structured programming. (6 marks)
- d. Explain variables using the appropriate syntaxes showing how they are declared programming. (4 marks)

**QUESTION THREE (20 marks)**

- a. Discuss any five techniques in which you would carry out a requirement analysis for a software development project. (10 marks)
- b. Think of a problem within your surrounding for which your expertise integrated with programming would be extremely useful. Highlight a step by step process that would lead to a technology mediated solution. (10 marks)

**QUESTION FOUR (20 marks)**

- a. Discuss any five functional ways in which programming operations have evolved in the recent past. (10 marks)
- b. Elaborate on five ways in which you would use programming techniques to improve the efficiency of governance systems in low and middle income countries. (10 marks)

**QUESTION FIVE (20 marks)**

An Enterprising Farmer took a loan of Kshs. 400,000 from a local bank at an interest rate of 10% payable in four years. Assuming you wish to develop a computer program that will keep track of monthly repayments:

- a. Identify the input, processing and output requirements for such a program. (4 marks)
- b. Design the algorithm for the program above using a simple flowchart and pseudocode. (6 marks)
- c. Explain the relevance of operators, Bitwise, Arithmetic and operational operators in programming. (4 marks)
- d. Using block diagrams distinguish between while loop and a do while loop control structure in programming. (6 marks)