



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY  
SCHOOL INFORMATICS AND INNOVATIVE SYSTEMS**

**UNIVERSITY EXAMINATION FOR  
THE DEGREE OF BACHELOR OF SCIENCE  
IN COMPUTER SECURITY & FORENSICS**

**1<sup>ST</sup> YEAR 2<sup>ND</sup> SEMESTER 2024/2025 ACADEMIC YEAR**

**CENTRE: MAIN**

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**COURSE CODE: ICB 1102**

**COURSE TITLE: SYSTEMS BUILDING**

**EXAM VENUE: LAB 7**

**STREAM: BSc. Computer Security & Forensics**

**DATE: 24/4/2027**

**EXAM SESSION: 15.00-17.00**

**TIME: 2 HOURS**

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**Instructions:**

1. Answer ANY three questions.
2. Candidates are advised not to write on the question paper.
3. Candidates must hand in their answer booklets to the invigilator while in the examination room.

## QUESTION ONE

- (a.) Explain the difference between a data-oriented approach and a functional-oriented approach to requirements elicitation. Provide an example of when each approach would be most appropriate. **(10 Marks)**
- (b.) Discuss the importance of control and audit considerations during the requirements capture process. **(5 Marks)**
- (c.) Describe how specifications (e.g., standards, regulations) can be used as requirements elicitation tools. **(5 Marks)**

## QUESTION TWO

- (a.) Describe the Systems Development Life Cycle (SDLC) phases, including Planning, Analysis, Design, Implementation, and Maintenance. **(10 Marks)**
- (b.) Compare and contrast iterative approaches, such as prototyping, rapid application development (RAD), and extreme programming (XP), as project management methodologies. **(10 Marks)**

## QUESTION THREE

Explain the principles of database design and development using the data-oriented approach, emphasizing Entity-Relationship (ER) modeling, relationships, keys, dependencies, and normalization. **(20 Marks)**

## QUESTION FOUR

Compare and contrast the top-down and bottom-up approaches to project management, highlighting the scenarios where each approach might be most appropriate. **(20 Marks)**

## QUESTION FIVE

- (i.) **Which of the following is NOT a core principle of Object-Oriented Programming (OOP)? (4 Marks)**
  - a) Encapsulation
  - b) Inheritance
  - c) Polymorphism
  - d) Algorithm Design
- (ii.) **In UML, which diagram is used to represent the interactions between objects in a sequence over time? (4 Marks)**
  - a) Use Case Diagram

- b) Class Diagram
  - c) Sequence Diagram
  - d) State Diagram
- (iii.) **Which OO concept represents a "has-a" relationship between two classes? (4 Marks)**
- a) Inheritance
  - b) Generalization
  - c) Composition
  - d) Aggregation
- (iv.) **In UML, which diagram is most suitable for depicting the different states of an object and the transitions between those states? (4 Marks)**
- a) Class Diagram
  - b) Use Case Diagram
  - c) State Diagram
  - d) Activity Diagram
- (v.) **What is the purpose of "abstraction" in Object-Oriented Programming? (4 Marks)**
- a) To expose all implementation details to the user.
  - b) To hide complex implementation details and provide a simplified view of an object.
  - c) To create multiple instances of a class.
  - d) To define the relationships between classes.