



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

**UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF  
BUSINESS INFORMATION SYSTEMS**

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

---

**MAIN CAMPUS**

**COURSE CODE: ITB 2106**

**COURSE TITLE: FUNDAMENTALS OF SOFTWARE DEVELOPMENT**

**EXAM VENUE: CL 1      STREAM: BSC. BUSINESS INFORMATION SYSTEMS**

**DATE: 22/4/2025      SESSION: 9.00-11.00**

**TIME: 2.00 HOURS**

---

**INSTRUCTIONS:**

- 1. Answer Question 1 (Compulsory) and ANY other two 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 1

- a) Explain **FOUR** ways how you can implement a basic authentication system in a web application? 4mks
- b) Describe a scenario where you would use a microservices architecture. 2mks
- c) State **TWO** ways of ensuring secure data transmission between client and server? 2mks
- d) Describe **FOUR** steps of conducting a stakeholder analysis in a software project? 2mks

**Answer:** Stakeholder analysis involves identifying all stakeholders who are affected by or have an interest in the project. Steps include:

- e) Highlight **TWO** principles would you follow when designing a user-friendly mobile application? 2mks
- f) State four ways of optimizing a slow SQL query? 2mks
- g) What are the **FOUR** different levels of software testing? Briefly describe each. 2mks
- h) What is the difference between a bug, a defect, and an error? 3mks
- i) A social media platform experiences frequent outages during peak usage. State **TWO** ways how you would address this to improve reliability and availability? 2mks
- j) What is Software Quality Assurance (SQA)? 2mks
- k) What are some of the **THREE** techniques for improving software reliability and availability? 3mks
- l) What is a Gantt chart? 1mk
- m) Explain **THREE** ways how AI-driven test automation can improve software development 3mks

## Question 2

Your team is working on a project to build an e-commerce platform, and a developer submits a pull request for a feature that adds product filtering (e.g., by price, category). The code works but has potential issues in terms of scalability, readability, and maintainability. Describe the **SIX** steps of how you would conduct a code review to provide constructive feedback. 12mks

- b) A startup wants to build a mobile app but has limited resources. They ask, “What are the key principles of software development we should follow to ensure success with minimal waste?” State and explain the **SEVEN** key principles of software development. 8mks

### Question 3

- a) A large organization is transitioning from Waterfall to Agile for a customer support ticketing system project. The team is resistant, citing comfort with Waterfall's predictability. Identify and explain **SIX** ways how you would convince them of Agile's benefits. 12mks
- b) What is software evolution? State **SIX** reasons why it is necessary? 8mks

### Question 4

- Your company is planning to migrate its legacy on-premise application to the cloud. Describe in details the **SEVEN** steps you would take to ensure a successful migration using DevOps principles. 14mks
- b) Identify and explain **THREE** ways how serverless computing can enhance a DevOps workflow. 6mks

### Question 5

- a) Explain the **FOUR** implications of quantum computing for software development, and describe **FIVE** ways how developers should prepare for this trend as of 2025? 10mks
- b) A software project lacks proper documentation, causing delays in onboarding new team members. Describe **SEVEN** approaches you would use to address this issue mid-project, giving one specific real world example at the end. 10mks