



NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF APPLIED SCIENCES

DEPARTMENT OF COMPUTER SCIENCE

ENTERPRISE ARCHITECTURE PROGRAMMING

SCS5107

Examination Paper

This examination paper consists of 3 pages

Time allowed: 3 hours

Total Marks: 100

Special Requirements: None

Examiner's Name: S. Ndlovu

External Examiner: Dr Cross Gombiro

INSTRUCTIONS TO THE CANDIDATES

1. Answer any four (4) questions
2. Each question carries 25 marks

MARK ALLOCATION

QUESTION	MARKS
1.	25
2.	25
3.	25
4.	25
5.	25

QUESTION 1

Enterprise applications are constantly evolving to meet the needs of modern businesses. Discuss the following topics in the context of enterprise application development:

- a) Briefly explain the concept of multi-tier architecture and how it addresses some of the challenges faced by traditional monolithic applications. [5]
- b) Identify and discuss two key trends in enterprise application development and explain the challenges associated with each trend. [10]
- c) Compare and contrast the Model-View-Controller (MVC) architecture with another application architecture pattern (e.g., n-tier architecture). Discuss the advantages and disadvantages of each approach for enterprise applications. [10]

QUESTION 2

Imagine you are tasked with developing a dynamic and interactive web application for a social networking platform.

- a) Discuss how you would leverage Web 2.0 principles, AJAX techniques, and potential benefits of using an AJAX framework for this project. [10]
- b) Implement the above using Java. [15]

QUESTION 3

You are required to develop a basic online shopping cart application using Java Servlets and JSP. The application should allow users to browse a list of products, add them to their cart, and view the cart contents.

Requirements:

- a) Develop a Servlet to handle user requests for browsing products and adding them to the cart. [7]
- b) Implement a JSP page to display the product list and the shopping cart contents. [7]
- c) The application should maintain the shopping cart information on the server-side (e.g., using a session object). [5]
- d) Include basic functionalities like adding quantity for each product in the cart. [6]

QUESTION 4

You are working as part of a software development team that is collaborating on a project hosted on GitHub. Describe how you would use GitHub to manage and contribute to the project effectively. In your answer, include the following:

- i. How would you set up a new repository for the project? [5]
- ii. Explain the process of branching and merging in GitHub. [6]
- iii. Describe how you would use GitHub to track issues and manage project tasks. [7]
- iv. How can the team ensure the codebase is kept clean and conflict-free using GitHub features? [7]

QUESTION 5

- a) Describe the concept of a connection pool and its benefits for improving database access performance in enterprise applications. [10]
- b) Consider a Java application that frequently interacts with a MySQL database. Describe the steps involved in establishing a connection to the database using JDBC, including:
 - i. Loading the JDBC driver
 - ii. Specifying connection details (URL, username, password)
 - iii. Obtaining a connection object [15]

END QUESTION PAPER