MAHARAJA AGRASEN INSTITUTE OF TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

ACADEMIC SESSION (JANUARY-JUNE 2025)

FSD-318T/CIE-306T

ADVANCED JAVA PROGRAMMING

ASSIGNMENT-1 (UNIT-1) **Maximum Marks-10 marks**

Instructions-

1. Answer each question with proper explanations and code where applicable.
2. Provide well-commented code to demonstrate your understanding and submit the assignment in a well-formatted document on A4 sheets by 17/02/2025.
3. Each question carries 2 marks.

Q1. How does method resolution work in multiple inheritance when default methods are involved? CO1

Q2. XYZ Bank provides online banking services where customers can perform transactions such as fund transfers, bill payments, and balance inquiries. The system must handle exceptions such as insufficient balance, invalid account details, and transaction failures. CO1

1. Implement Exception Handling in Java
    a) Create a BankAccount class with methods for deposit(), withdraw(), and transfer().
    b) Use custom exceptions (InsufficientFundsException, InvalidAccountException) to handle errors.
2. Scenario-Based Exception Handling
    a) Simulate a transaction failure due to insufficient funds.
    b) Handle an invalid account number scenario using exception handling.

Q3. A ride-sharing app allows multiple users to request rides simultaneously. The system must assign available drivers efficiently while handling exceptions like no drivers available, invalid requests, or ride cancellations. CO1

1. Multi-Threaded Ride Matching
    a) Implement a system where multiple users request rides simultaneously.
    b) Use synchronized blocks to prevent multiple users from getting the same driver.
2. Handling Exceptions
    a) Simulate a scenario where all drivers are busy, throwing a NoDriverAvailableException.
3. Race Condition Prevention
    a) Show how race conditions occur when multiple users try to book the same driver.
    b) Fix the issue using synchronization.

Q4. Create a Java Applet for the Quiz UI CO1

a) Display multiple-choice questions with radio buttons.
b) Use event handling to capture user selections.
c) If the user submits the quiz without selecting an answer, throw a NoAnswerSelectedException

Q5. Imagine you are developing a server-client system using Java sockets. The client sends a message to the server, and the server responds with a reversed version of the message. CO1

(a)Identify and explain the roles of ServerSocket and Socket in this communication.
(b)Discuss how InputStream and OutputStream are used for data transmission between client and server.