Roll No. | | | | | | | | | | |

B.E (FT) END SEMESTER EXAMINATIONS – APRIL / MAY 2025

COMPUTER SCIENCE AND ENGINEERING

SEMESTER V

CS6110 Object Oriented Analysis and Design

(Regulation 2018 - RUSA)

Time: 3 Hours | Answer ALL Questions | Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Explain how UML improves collaboration among team members during object-oriented analysis and design.
2. Given a Library Management System, identify two key actors and analyze their primary use cases.
3. Compare include and extend relationships in use case diagrams with examples, and analyze when to use each.
4. Analyze the concept of aggregation and illustrate it with a real-world example.
5. Apply the purpose of a system sequence diagram by describing its role in modeling system behavior.
6. Identify two elements of an activity diagram and analyze how they represent workflow in a process.
7. Evaluate two UML diagrams used for implementation modeling and justify their importance.
8. Explain the principle of "Low Coupling" and evaluate its impact on software maintainability.
9. Analyze the Factory Method design pattern and explain why it is preferred for object creation.
10. Evaluate the role of a test plan in software development and how it ensures product quality.

PART – B (8 x 8 = 64 marks)

(Answer any 8 questions)

11. Analyze the Unified Process in OOAD and compare it with traditional SDLC using a student enrollment system as an example.
12. Create a use case diagram for an online examination system with actors like Student, Admin, and Examiner.
13. Develop a domain model for a Library Management System with classes like Member, Book, and Librarian.
14. Design a class diagram for a vehicle management system using generalization, aggregation, and composition.
15. Draw a system sequence and communication diagram for a movie ticket booking process: select movie, choose seats, make payment.
16. Create a state machine diagram for an ATM system with states like Idle, Card Inserted, and Transaction Processing.
17. Design a component and deployment diagram for a Student Information System with components like Web UI and Database.
18. Refactor a tightly coupled "Manager" class using GRASP principles and present an improved class diagram.
19. Apply two GoF design patterns (e.g., Strategy, Memento) to a text editor system and justify their usage.
20. Create a test plan with sample test cases for a hotel reservation system (features: Book Room, Cancel Booking).
21. Analyze design improvements in your OOAD project over time, focusing on diagram refinement.
22. Design an OOAD solution for an online shopping system with use case, class, sequence diagrams, and one design pattern.

PART – C (2 x 8 = 16 marks)- Answer all

23. Analyze the relationship between sequence diagrams and communication diagrams in UML using an online food ordering scenario.
24. Evaluate the Observer and Strategy design patterns for a stock trading application and justify which is better for real-time updates.