Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–V EXAMINATION – WINTER 2025

Subject Code:3151604 Date:19-11-2025

Subject Name:Object Oriented Analysis and Design

Time:10:30 AM TO 01:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define Object-Oriented Analysis and Design (OOAD) and explain its significance in modern software development.	**03**
	(b)	Explain Different types of Models in OOAD with its importance.	**04**
	(c)	Analyze the role of generalization in class diagrams and how it is used to represent inheritance relationships between classes.	**07**
Q.2	**(a)**	Explain the difference between a class and an object in Object-Oriented Analysis and Design (OOAD), and provide a scenario where both are used.	**03**
	(b)	Define the purpose of following terms with its notations. i) state ii) transition iii) event iv) guard condition.	**04**
	(c)	Analyze the role of interfaces in Object-Oriented Analysis and Design (OOAD), discussing how they are used to define contracts between classes and promote loose coupling.	**07**
		OR	
	(c)	Prepare a use case diagram for an online Airline reservation system.	**07**
Q.3	**(a)**	Describe the structure of an activity diagram in Object-Oriented Analysis and Design (OOAD), including nodes, edges, and actions.	**03**
	(b)	Discuss the concept of actor-role modeling in use case diagrams and how it is used to represent the roles played by external entities in a system.	**04**
	(c)	Critically examine the concept of special constructs in activity diagrams, such as parallelism and iteration, discussing how they enhance the modeling of complex system behaviors.	**07**
		OR	
Q.3	**(a)**	Explain the purpose of sequence diagrams in Object-Oriented Analysis and Design (OOAD), and provide a scenario where a sequence diagram is used to model system interactions.	**03**
	(b)	Compare and contrast the concepts of synchronous and asynchronous messages in sequence diagrams, providing examples to illustrate their representations.	**04**
	(c)	Explain the purpose of loop and conditional constructs in activity diagrams and how they are used to model repetitive and decision-based behaviors.	**07**
Q.4	**(a)**	Explain the purpose of system conception in the development life cycle and how it lays the foundation for subsequent stages of development.	**03**

	(b)	Compare and contrast the concepts of domain analysis and application analysis in Object-Oriented Analysis and Design (OOAD), providing examples to illustrate their differences.	**04**
	(c)	Define the purpose of following terms with suitable example and UML notations (i) swim lane (ii) use case generalization (iii) activity	**07**
		OR	
Q.4	**(a)**	Explain the purpose of an overview of analysis in domain analysis and how it provides a high-level understanding of the problem domain.	**03**
	(b)	Compare and contrast the concepts of domain interaction model and application interaction model in Object-Oriented Analysis and Design (OOAD), providing examples to illustrate their differences.	**04**
	(c)	Draw an Activity diagram for Hospital Management System with proper notations.	**07**
Q.5	**(a)**	How to breaking a system into subsystems.	**03**
	(b)	Explain the concept of handling boundary conditions in system design and how it helps ensure system robustness and reliability.	**04**
	(c)	Analyze the architecture of an ATM system, discussing its components, interactions, and how object-oriented principles are applied to design its structure and behavior.	**07**
		OR	
Q.5	**(a)**	Explain how to prepare a reuse plan	**03**
	(b)	Explain the process of organizing a class design, discussing strategies such as grouping related classes into packages and defining clear class interfaces.	**04**
	(c)	Analyze an ATM example in class design, discussing how classes are organized to represent different components and functionalities of the ATM system, and how object-oriented principles are applied to design its class hierarchy and relationships.	**07**

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