Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–V (NEW) EXAMINATION – WINTER 2022

Subject Code:3151604   **Date:06-01-2023**
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)**	What is object orientation? Explain OO themes	**03**
	(b)	What is model? Explain purposes of models. Also explain types of models.	**04**
	(c)	Prepare a class model for the hotel management system.The system should supports chain of hotels. A hotel contains two categories of rooms: executive and normal, both AC and non-AC. The customers of executive rooms can avail extra facilities like games, swimming, food service in rooms, etc. The booking is possible by internet or by phone. If the booking is through phone, process is done by receptionist, and if booking is done through internet the process is carried out by customer through hotel website. Depending on the number of days customer stays, appropriate bill is generated. The bill also contains amount for transport, food and other facilities enjoyed by the customer along with necessary taxes. The manager should be able to generate reports like list of customers staying in the hotel, list of rooms empty, monthly/yearly income, etc.	**07**
Q.2	**(a)**	What is inheritance? List the different types of inheritance and explain how it encourages reusability and sharing.	**03**
	(b)	How does the object oriented approach differ from the traditional approach? Why is reusability important? How does Object-Oriented Software Development promote (achieve) and improve reusability?	**04**
	(c)	What is the importance of use case diagram? Explain relationships between use cases with suitable example and proper UML notations. Draw use case diagram for an'Online railway ticket reservation system'.	**07**

OR

	(c)	What is concurrency? Explain 'aggregation concurrency' and 'concurrency within an object' represented by state model with suitable example.	**07**
Q.3	**(a)**	Explain „ordered", „bags", „sequences" in class diagram with example each.	**03**
	(b)	Define and Discuss the following OO characteristics. Identity, Classification, Polymorphism., encapsulation	**04**
	(c)	A customer decides to upgrade her PC and purchase a DVD player. She begins by calling the sales department of the PC vendor and they tell her to talk to customer support. She then calls customer support and they put	**07**

her on hold while talking to engineering. Finally, customer support tells the customer about several supported DVD options. The customer chooses a DVD and it is shipped by the mail department. The customer receives the DVD, installs it satisfactorily and then mails her payment to accounting. Construct an activity diagram for this process. Use swimlanes to show the various interactions.

OR

Q.3	(a)	Explain nested states with appropriate diagram	03
	(b)	Compare and contrast waterfall and iterative development life cycle model.	04
	(c)	Construct a class modeling that reifies and supports the following state modelingconcepts:event,state,transition,condition,activity,signal event,change event,and signal attribute	07

Q.4	(a)	List and explain the steps to design algorithms with respect to class design.	03
	(b)	Explain following terms.	04
		1. Frameworks	
		2. Patterns	
		3. Layers	
		4. Guard condition	
	(c)	Draw a sequence diagram for issuing a book and renewing a book in online library management system	07

OR

Q.4	(a)	Define Reusable components and their use	03
	(b)	Consider online auction system. Elaborate the following high level questions and explain your answer	04
		1. Who is the application for?	
		2. Who are the stake holders?	
	(c)	Define the purpose of following terms with suitable example and UML notations	07
		(i) swimlane (ii) use case generalization (iii) activity	

Q.5	(a)	Explain the tasks involved in design optimization	03
	(b)	Differentiate the following	04
		1. Event and State	
		2. Association and Aggregation	
	(c)	Mention the importance of analysis and design stages in software development process. Differentiate following with respect to analysis and design stages:	07
		i) Domain analysis vs. Application analysis	
		ii) System design vs. Class design	

OR

Q.5	(a)	Define scenario, sequence diagram. Explain with suitable diagram	03
	(b)	List and explain the steps of constructing application interaction model.	04
	(c)	Why software architecture is so important in system design? Enlist and briefly explain different architectural styles.	07

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