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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

April 2025 Semester End Make-Up Examinations

Programme: B.E. **Semester: V**

Branch: Computer Science and Engineering **Duration: 3 hrs.**

Course Code: 23CS5PCOOM **Max Marks: 100**

Course: Object Oriented Modelling

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	*CO*	*PO*	Marks
1	a)	Explain the concept of Reification with the help of a neat class diagram.	*CO1*	*PO1*	**6**
	b)	Differentiate between the following with examples: (i) Bags and Sequences (ii) Aggregation and Composition	*CO2*	*PO2*	**6**
	c)	The transportation company provides services for transporting goods and passengers across various regions. They offer a fleet of vehicles, including buses, trucks, and vans, that operate on different routes. The company also allows customers to book transportation for specific trips. The company needs a system to manage the fleet, employees, customer bookings, and transportation schedules. Design an Advanced class diagram by Identifying at least 8 Classes.	*CO3*	*PO3*	**8**
		OR			
2	a)	Prepare an object diagram for an imaginary round trip you took last weekend to London. Include at-least one instance of each class. Fortunately, direct flights on a hypersonic plane were available. A friend went with you but decided to stay back and is still there. Captain Johnson was your pilot on both flights. You had a different seat each way, but you noticed it was on the same plane because of a distinctive dent in the tail section. Students should indicate unknown values with a "?".	*CO1*	*PO1*	**6**
	b)	Identify how it is possible to remove ambiguity in one-to-many and many-to-many associations and explain with an example.	*CO2*	*PO2*	**6**

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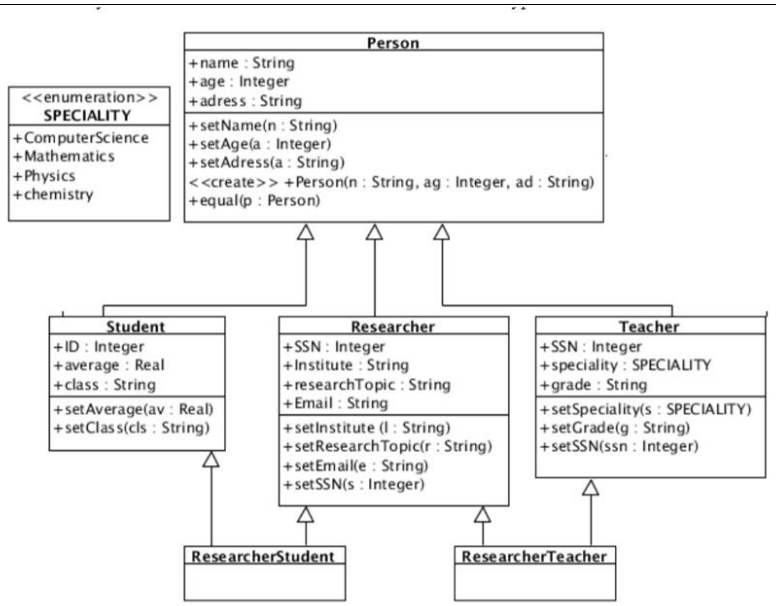
		c)	 Considering the above class model, restructure the same using the three types of workarounds. Suggest which among the three best suits the above the class model.	*CO2*	*PO2*	**8**
			UNIT - II			
	3	a)	With the help of a neat diagram analyze the relationship between Transitions and Guard conditions and explain.	*CO2*	*PO2*	**6**
		b)	Consider Home Loan application process and draw one-shot State diagram for the same and explain.	*CO3*	*PO3*	**6**
		c)	The state model implicitly supports concurrency among objects, analyze the different concurrency techniques supported with relevant examples.	*CO2*	*PO2*	**8**
			OR			
	4	a)	Differentiate between Change event and Time Event with an example	*CO2*	*PO2*	**6**
		b)	Describe Entry and Exit activities in State Diagram with examples	*CO1*	*PO1*	**6**
		c)	Design an Advanced State diagram for an Order Processing System (with Sub-state/Sub-machine for Payment Processing)	*CO3*	*PO3*	**8**
			UNIT - III			
	5	a)	Describe with a neat diagram the process of sending and receiving Signals in UML activity diagram.	*CO1*	*PO1*	**6**
		b)	Prepare an activity diagram that elaborates the details of logging into an email system. Note that entry of the user name and the password can occur in any order	*CO3*	*PO3*	**6**

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		c)	Consider the purchase of gasoline from an electronic gasoline pump. (1) Prepare a use case diagram. Normally the customer pays cash for a gas purchase. Add extend relationships to handle the incremental behavior of paying by credit card outside or paying by credit card inside. Add an include relationship to represent the optional purchase of a car wash. (2) List and explain the relevance of each actor. (3) Draw the Sequence model to show interactions between the actors	*CO3*	*PO3*	**8**
			OR			
	6	a)	Consider Customer order processing System, for the below set of use cases, prepare a use case diagram using include and extend relationships. i) Supply customer data ii) Order product iii) Arrange payment iv) Place order v) Request catalog	*CO1*	*PO1*	**6**
		b)	Consider stock management software that records all transactions that occur for a portfolio. For example, stocks may be purchased and sold. Dividend payments may be received. Complex situations can occur, such as stock splits. The current contents of a portfolio can be determined by replaying the transaction log. The portfolio has some initial contents, and all subsequent changes are captured via the transaction log. The changes in the transaction log are then applied through the target date to determine the current contents. Construct a procedural sequence diagram to show the calculation of the contents of a portfolio as of some date. Limit the detail in your diagram to four message flow	*CO3*	*PO3*	**6**
		c)	A customer decides to modify his top end car by replacing some of the accessories. He first checks by calling the sales department of the car vendor. He is directed by the vendor about its availability only at the company head-office. The customer calls the customer support, they enquire the customer about his requirements and confirm the customer about its availability after checking with the workshop department. The customer schedules a date with workshop department and gets the accessories fitted to his car. The payment is done after this. Construct an activity diagram for this process. Use swimlanes to show the various interactions.	*CO3*	*PO3*	**8**
			UNIT - IV			
	7	a)	Consider an ATM example and explain how to Find Initial and Final events for each use case in an application interaction model	*CO1*	*PO1*	**6**

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		b)	The following is a list of candidate classes for graphics system. Prepare a list of classes that should be eliminated. Give a reason for each elimination. If there is more than one reason, give the main one. character, line, x coordinate, y coordinate, link, position, length, width, collection, selection, menu, mouse, button, computer, drawing, drawing file, sheet, pop-up, point, menu item, selected object, selected line, selected box, selected text, file name, box, buffer, line segment coordinate, connection, text, name, origin, scale factor, corner point, end point, graphics object. Design a class diagram for the good classes you selected from the above procedure.	*CO2*	*PO2*	**6**
		c)	Consider an application of Online Shopping System, Analyze and explain the steps followed in constructing Application Class model.	*CO2*	*PO2*	**8**
			OR			
	8	a)	Describe the different sources and process of adding operations	*CO1*	*PO1*	**6**
		b)	Analyze the following Systems, for each of the following systems, identify the relative importance of the three aspects of modeling: 1) Class Modeling 2) State Modeling 3) Interaction Modeling. Explain your answers: i)Poker game ii) spelling checker	*CO2*	*PO2*	**6**
		c)	Analyze and explain the steps followed in constructing Domain State model for an airline system.	*CO2*	*PO2*	**8**
			UNIT - V			
	9	a)	Describe in detail about the three kinds of components in Forwarder-Receiver design pattern with an example	*CO1*	*PO1*	**10**
		b)	Analyze the different properties of patterns for software architecture considering Model-view-controller example	*CO2*	*PO2*	**10**
			OR			
	10	a)	Describe the phases of Client-Dispatcher-Server design pattern for a typical scenario with a neat diagram.	*CO1*	*PO1*	**10**
		b)	Justify that patterns must be presented in appropriate form, elaborate the pattern description template with an example	*CO2*	*PO2*	**10**

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