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

Autonomous Institute Affiliated to VTU

June 2025 Semester End Main Examinations

Programme: B.E.   Semester: VI
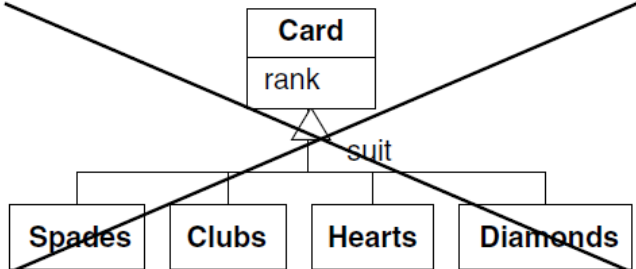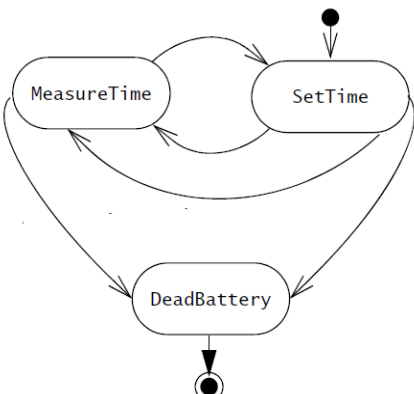Branch: Information Science and Engineering   Duration: 3 hrs.
Course Code: 23IS6PCOMD   Max Marks: 100
Course: Object Oriented and Modelling Design Patterns

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

			UNIT - I	CO	PO	Marks
1	a)		Define UML? Write the importance of using UML notations?	CO1	PO1	4

	b)		Consider the given snippet to draw a class model.
			Class Movie{
			private string movie_name;
			private integer actorCount=50;
			public void calculateBoxofficeAmout(String movie_name)
			{…}
			public void calculateActorsSalary(String movie_name) { ..}
			public boolean HitOrFlop(Expense s,Collection c) {..}
				CO1	PO2	8

	c)		Summarize the models in OO development. Highlight the relationships among the models.	CO1	PO1	8
			OR			
2	a)		Explain the class models, state models and interaction models. A college has set of faculties. There is a Principal and set of faculties. Each faculty is assessed by Principal to get bonus. Write a class diagram for the same, use association class.	CO1	PO1	10
	b)		Prepare a class diagram and object diagram for the following details. A newspaper document has 4 pages. The first page has a red point and a yellow square displayed on an article. The second page contains a line and an ellipse on a figure. An arc, a circle, and a rectangle appear on the last two pages of sports section. In preparing your diagram, use one or more generalizations.	CO1	PO1	10
			UNIT - II			
3	a)		Prepare a class diagram, add suitable relationships (associations and generalizations). Use association names and association end names where needed. Also use qualified associations and show multiplicity. You need to show attributes & operations. As you prepare the diagrams, you may add classes.	CO1	PO2	10

			Bank, Customer, Account, Current Account, Savings Account, Atm, Atm Transation			
	b)		List the properties of association ends.	*CO1*	*PO1*	**5**

	c)		Differentiate between the following using suitable illustrations
			
			  i) Aggregation and Composition
			
			  ii) Abstract class and Concrete class
				CO1	*PO1*	**5**

			OR			
4	a)		Prepare a class diagram, add suitable relationships (associations and generalizations). Use association names and association end names where needed. Also use qualified associations and show multiplicity. You need to show attributes & operations. As you prepare the diagrams, you may add classes. Computer, Mother Board, CPU, Memory, RAM, ROM, Counters	*CO2*	*PO2*	**10**
	b)		i) The given model is noted as a wrong model. Justify the reason. Also provide a suitable data type to represent the same. ii) A student has one name, one USN, one or more addresses, zero or more phone numbers, and one birthdate. Represent these details using a UML notation.	*CO2*	*PO1*	**10**
			UNIT - III			
5	a)		Explain the activity effects. Complete the state transition model, identify the missing transitions and add suitably the activities. 	*CO2*	*PO2*	**10**
	b)		A B.E student assings a set of alarms on the phone to assess her study period. Include all possible states for the model to depict a meaninful state diagram.	*CO2*	*PO2*	**10**
			OR			

	6	a)	Differentiate between State and Event? Draw a state diagrm for a Telephone system?	*CO2*	*PO1*	**10**
		b)	Depict the Signal Event, Change Event and Time Event with suitable UML notations. • A Flight departs from an airport • Mouse is moved on the desktop interface • A notepad has a group of text edited • A phone call is received • A phone number is dialed	*CO2*	*PO2*	**10**
			UNIT - IV			
	7	a)	A door lock is automated. A pin is entered to unlock and enter the home. Write a submachine for CheckPin state.	*CO2*	*PO1*	**10**
		b)	Explain the different ways of concurrency handling in state modelling with UML diagrams.	*CO2*	*PO3*	**10**
			OR			
	8	a)	Draw a vending machine state diagram with detailed substate diagram? Explain in detail?	*CO2*	*PO1*	**10**
		b)	Draw a state machine diagram to depict the dispatch of an item for booking order done by customer through online. Once the company receives the order, the item is checked in the stock, if available company sends the item for packing and dispatch. If the item is not in stock, company waits till stock arrive. After the items arrive, it is sent for packing and dispatch. Item is delivered to the customer. Indicate the necessary guard conditions and events.	*CO2*	*PO2*	**10**
			UNIT - V			
	9	a)	Draw a usecase diagram and sequence diagram for a login and query process on a database sytem.	*CO3*	*PO3*	**10**
		b)	Define design patterns. Illustrate with an example different types of patterns.	*CO3*	*PO1*	**10**
			OR			
	10	a)	What is a pattern ? Write the different categories of patterns with suitable explanations.	*CO3*	*PO1*	**10**

		b)	Consider an online airline reservation system.
			  i) List two actors. Explain the relevance of each actor.
			  ii) One use case is to make a flight reservation. List four additional use cases at a comparable level of abstraction. Summarize the purpose of each use case with a sentence.
			  iii) Write a normal scenario
			  iv) Write an exception scenario
			
			Prepare a use case diagram for an online airline reservation system.
				CO3	*PO1*	**10**

******