Name: **Enrolment No:**	

UPES

End Semester Examination, May 2023

Course: Object-Oriented Analysis and Design using UML **Semester: II**

Program: MCA **Time: 03 hrs.**

Course Code: CSEG 7013 **Max. Marks: 100**

Instructions: Attempt all questions.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q 1	Write a note on association, aggregation, and composition. Give examples.	**4**	**CO2**
Q 2	Give a brief on the expected benefits of Object-oriented software development.	**4**	**CO1**
Q 3	Elaborate on the rational Unified Approach giving a brief about its phases.	**4**	**CO1**
Q 4	Differentiate the state chart diagram from a flowchart.	**4**	**CO4**
Q 5	"Interaction diagrams are used when we want to understand the message flow and the structural organization." Explain	**4**	**CO5**
	SECTION B **(4Qx10M= 40 Marks)**		
Q 6	Evaluate and name the UML diagrams used for the following: a) Modelling requirements b) Modeling workflows c) Modeling the behavior of an object d) Interaction between groups and objects	**10**	**CO1**
Q 7	Create a state diagram for the Windows login system. Assume that the user is given three attempts to properly enter her/his password.	**10**	**CO4**
Q8	Consider the following use cases that play a role in the banking system: i) Deposit ii) Withdraw (Minimum balance must be checked) Model sequence diagrams for the above two use cases. **OR** Draw an activity diagram with swim lanes for the following scenario to withdraw money from an ATM. Use only this description (do not make up your own information!).	**10**	**CO3**

	The customer inserts the ATM card and then enters their pin number. The Bank system then validates the pin. If the pin is invalid, the ATM machine ejects the card, the customer takes the card, and the scenario ends. Assuming the card pin was valid, the customer enters an amount to withdraw. The bank checks the account balance. If the balance is less than the amount to withdraw, the ATM shows the balance and then ejects the card. Once ejected the customer then takes the card and the scenario ends. Assuming the amount is available, the customer takes money from the slot and AT THE SAME TIME the bank debits the account. Once the customer has taken the money and the account debit is complete the ATM machine shows the balance. The ATM machine then ejects the card, the customer takes the card and the scenario ends.		
Q9	"A component represents a modular, deployable, and replaceable part of a system that encapsulates implementation and exposes a set of interfaces." Elucidate with an example.	**10**	**CO5**
	SECTION-C **(2Qx20M=40 Marks)**		
Q 10	Consider an elevator that has basic functions such as moving up and down, opening and closing the doors, and picking up passengers. The elevator is supposed to be used in a building having floors numbered from 1…n. There are call buttons in the elevator corresponding to each floor. For every floor, except floors 1 and n there are two-floor call buttons for passengers to call the elevator for going up and down. There is only one down-call button on floor n and one up-call button on floor1. When the car stops on the floor the doors are opened and the elevator light indicating the current direction elevator is going is illuminated so that passengers can know the current moving direction of the elevator. When the elevator is moving music audio is played inside the elevator. **Draw a class diagram, activity diagram, and component diagram for designing this system**.	**20**	**CO3**
Q 11	**Create a Use Case Diagram (in UML) for the following description of an Internet auction system:** **Types of users** • Anyone • Anyone may use the search features of the system. • Anyone may look at an auction's information. **Members** • Only members may bid or place items for sale. • All members must register with the system. • Members must supply their name and a valid e-mail address. • After registering, the system will create an account for the member.	**20**	**CO2**

	• A password will be mailed to the e-mail address specified. • Members must log in to bid or place an item for sale. • Members who forget their password can have it e-mailed to them. **Auctions** An auction involves an item, a seller, and zero or more bidders. **Items and sellers** • Sellers put up items for auction. • The item must include a name, a closing time, and a minimum bid. • The item may include a description and a picture. • Sellers may have any number of auctions active at one time. **Bids and bidders** • Any member may bid in any auction. • Bids may be placed at any time before the closing time. • A bid must be at least the minimum bid, and higher than any bid so far. • Ending an auction. • No matter how an auction ends, it is immediately removed from the list of active auctions. • If no bids are placed before the closing time, the auction is closed unsuccessfully, and the seller is notified by e-mail. • If at least one legal bid has been placed before the closing time, the auction is closed successfully. The winning bidder and the seller both mailed each other's contact information and the winning bid. • The seller may cancel the auction up to 24 hours before the closing time. All bidders on this auction will be mailed a notice of the cancellation. **Searching** • Any user may search through active auctions by keyword. • All active auctions with names or descriptions containing the keyword are presented to the user. • The auctions are sorted by closing time in chronological order. • The user may click a link to go directly to the auction. **Create a use case diagram for this system.** **OR** A university conducts examinations, and the results are announced. Prepare a report for the following: • Print the marks in the register number order semester-wise for each department. • Print the arrear list semester-wise.		

	• Prepare a rank list for each department. • Prepare final-aggregate mark list for final-year students. **Identify the problem statement and design and explain the classes for each functionality. Design the use case and the class diagram for designing this system**.		