Course Code: MCA-104   **Course Name: Object-Oriented Software Engineering**

Practice Questions (Theory)

	UNIT– I
Q1.	Contrast Objects and Classes with suitable example.
Q2.	Distinguish between Generalization and Specialization.
Q3.	Explain the Rational Unified Process.
Q4.	Compare Traditional and Object-Oriented Life Cycle model.
Q5.	Justify the statement, "System Development is Model Building".
Q6.	Explain the statement, "The requirements model is structured in the analysis model".
Q7.	Maintaining traceability during requirements and subsequent activities is expensive, because of the additional information that must be captured and maintained. What are the benefits of traceability that outweigh this overhead?
Q8.	What is meant by the statement "objects are not classes, but instances of classes. However, classes can be considered objects"? In other words, in what sense is a class also an object?
Q9.	Identify and justify the relationship that the following objects may share: a) Bus and Passengers b) Table of Contents and Book c) Savings Account and Bank Account d) Attendance Sheet and Student
Q10.	Elaborate UML architecture with reference to the static and dynamic models generated by each system view?
Q11.	Elaborate has-a relationship in detail with suitable example?
Q12.	How does an association differ from an aggregation in UML?
Q13.	Explain the concept of multiplicity in UML.
	UNIT II
Q14.	Identify the various analysis objects in the Recycling Machine Example. Support your answer with appropriate representations.
Q15.	Consider a file system with a graphical user interface, such as Macintosh's Finder, Microsoft's Windows Explorer, or Linux's KDE. The following objects were identified from a use case describing how to copy a file from a floppy disk to a hard disk: File, Icon, TrashCan, Folder, Disk, Pointer. Identify the entity objects, interface objects and control objects.
Q16.	Consider an ATM system. Identify atleast 3 different actors that interact with this system?
Q17.	Can a system under consideration be represented as an actor?
Q18.	Differentiate between a scenario and a use case?

Q19.	Draw a class diagram representing a book defined as follows: "A book is composed of a number of parts, which in turn are composed of a number of Chapters. Chapters are composed of sections. Focus only on classes and relationships.
Q20.	Draw a class diagram to represent the relationship between parents and children. Take into account that a person can have both a parent and a child. Annotate associations with roles and multiplicities.
Q21.	Differentiate between a role and a participant?
Q22.	Justify if a role can be shared between 2 or more participants? Why or why not?
Q23.	Justify with an appropriate example why an include relationship would be preferable to an extend relationship?
Q24.	Suppose we have a stock trading application that needs to notify users of changes in stock prices but allows users to choose how they want to be notified (e.g. via email or text message). (i) Explain the intent and relevance of the observer design pattern for this problem. (ii) Explain the intent and relevance of the singleton design pattern for this problem
Q25.	Contrast singleton and multiton design pattern.
Q26.	Draw a use case diagram for a ticket distributor for a train system. The system includes two actors: a traveler who purchases different types of tickets, and a central computer system that maintains a reference database for the tariff. Use cases should include BuyOneWayTicket, BuyWeeklyCard, BuyMonthlyCard, and UpdateTariff. Also include the following exceptional cases: TimeOut (i.e., traveler took too long to insert the right amount), TransactionAborted (i.e., traveler selected the cancel button without completing the transaction), DistributorOutOfChange, and DistributorOutOfPaper.
Q27.	Discuss the role of swimlanes in an activity diagram?
Q28.	Contrast between the different interaction diagrams?
Q29.	Analyze the relationship between a class and object diagram with an appropriate example?
Q30.	What activities are typically included in the inception phase of a project? How do these activities contribute to project success?
Q31.	How do you track the progress of a project? What tools or techniques do you use to ensure that the project stays on schedule and within budget?
UNIT III	
Q32.	With appropriate example, justify the purpose of construction phase in object-oriented analysis model.
Q33.	Case Study: ARENA is a multi-user, Web-based system for organizing and conducting tournaments. ARENA is a game independent in the sense that organizers can adapt a new game to the ARENA game interface, upload it to the ARENA server, and immediately announce and conduct tournaments with players and spectators located anywhere on the internet. Organizers can also define new tournament styles, describing how players are mapped to a set of matches and how to compute an overall ranking of players by adding up their victories and losses (hence, figuring out who won the tournament). To recoup their operational costs, organizers can also invite potential sponsors to display advertisement

	banners during games. Q1: Identify and write definitions for any additional entity, boundary, and control objects participating in the Announce Tournament use case? Q2: Draw a state machine learning describing the behavior of the Announce Tournament Control Object based on the sequence diagrams? Q3: Draw a complete use case for search engine design?
Q34.	Consider a system that includes a Web server and two database servers. Both database servers are identical: the first acts as a main server, and the second acts as a redundant back-up in case the first one fails. Users use Web browsers to access data through the Web server. They also have the option of using a proprietary client that accesses the databases directly. Draw a UML deployment diagram representing the hardware/software mapping of this system.
Q35.	Evaluate the Iterator design pattern with an appropriate example?
Q36.	Contrast analysis and design phase. How are they similar, how do they differ?

Q37.	Draw a state machine for an online store, which allows a user to add and remove items from a shopping cart. Additions only occur when the user is shopping; removals can occur when the user is editing the cart. When done with shopping, the user can save the cart for future use or checkout. If no item has been added, or the last item has been removed, the cart is not accessible. For this problem, we shall model only the inputs and the states they result in; outputs could be added later. The input classes are:
	   • add: the user selects an item on a shopping page to be added to the cart
	   • remove: the user selects an item in the cart to be removed
	   • view: the user asks to see the shopping cart
	   • continue: the user asks to continue shopping
	   • save: the user asks to save the cart
	   • checkout: the user asks to checkout and pay for the items in the cart

Q38.	Explain the concept of design patterns and their importance in software development.
Q39.	Discuss the singleton design pattern. When is it appropriate to use this pattern, and what are its advantages and disadvantages?
Q40.	Describe the adapter design pattern. How does it help in integrating incompatible interfaces?
Q41.	Explain the observer design pattern. How does it enable one-to-many dependency relationships between objects?
UNIT IV	
Q42.	Elaborate the various levels of testing.
Q43.	Identify who should perform the different levels of testing.
Q44.	Elaborate the agile manifesto in brief.
Q45.	List the extreme programming characteristics that help achieve change.
Q46.	List the principles of agile software development.
Q47.	Who are the different parties involved in software testing, and how does the testing shift from one party to another?

Q48.	Contrast fault to a failure?
Q49.	Explain the use of stubs in top-down integration testing?
Q50.	Discuss the importance of sprint in a scrum?
Q51.	Justify the statement, "Agile is an adaptive approach to system development that allows for uncertainity"
Q52.	Elaborate the XP practices that embody the basic practices of Extreme Programming?
Q53.	Analyze the three main organizational elements that affect a scrum project?
Q54.	Evaluate the testing process?
Q55.	Explain the Agile Manifesto and its principles. How do these principles guide the implementation of Agile methodologies in software development projects?
Q56.	Discuss the roles and responsibilities of the Scrum Master, Product Owner, and Development Team in a Scrum project. How do these roles contribute to the success of the project?

**************Wish you luck!**************