

Course Name : MSCIT

Subject Name : Object Oriented Analysis and Design using UML

Subject Code : MSCIT-203

Date : 23-02-2026

Time : 11:30AM TO 01:45PM

Max Marks : 70

Section A

Q.-1. Respond to any three of the following questions in brief. (30)

- (1) Discuss the essential features of Object-Oriented Programming (OOP), specifically focusing on Encapsulation, Abstraction, Inheritance, and Polymorphism.
- (2) Explain the Domain Analysis process, its key activities, and the benefits of performing it for systematic software reuse.
- (3) Explain the System Design Process, covering partitioning the analysis model, concurrency, and task management.
- (4) Discuss the various categories of Design Patterns (Creational, Structural, Behavioral) and explain why they are used.
- (5) Explain Structural Design Patterns, specifically detailing the Adapter, Decorator, Facade, and Proxy patterns.

Section B

Q.-2. Write short notes on any four of the following topics. (20)

- (1) Explain the difference between an active and a passive state.
- (2) Briefly explain the Model layer in MVC architecture.
- (3) What is a "Lifeline" in a sequence diagram?
- (4) Explain the "extends" relationship in Use Case diagrams.
- (5) What is a Deployment Diagram and what does it emphasize?
- (6) Describe the purpose of a Timing Diagram.

Section C

Q.-3. Multiple Choice Questions (10)

(1) What is the process of hiding internal implementation details and combining data with methods called?

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|----------------|------------------|
| A) Abstraction | B) Encapsulation |
| C) Inheritance | D) Polymorphism |

(2) Which relationship is defined by Inheritance in object-oriented programming?

- | | |
|-----------|------------|
| A) Has-a | B) Part-of |
| C) Uses-a | D) Is-a |

(3) In a CRC model, what does the 'C' on the right side of the card stand for?

- | | |
|--------------|-----------------|
| A) Class | B) Collaborator |
| C) Component | D) Control |

(4) Which design pattern ensures a class has only one instance and provides a global point of access to it?

- | | |
|--------------|--------------|
| A) Factory | B) Builder |
| C) Prototype | D) Singleton |

(5) Which UML diagram type emphasizes the time-ordering of messages?

- | | |
|---------------------|---------------------|
| A) Class Diagram | B) Sequence Diagram |
| C) Activity Diagram | D) Package Diagram |

(6) Which diagram shows the configuration of run-time processing nodes and the components that live on them?

- A) Component Diagram
- B) Deployment Diagram
- C) Object Diagram
- D) Statechart Diagram

(7) Which type of message waits for a reply before the interaction can move forward?

- A) Asynchronous
- B) Synchronous
- C) Found
- D) Lost

(8) What does the UML operator 'Opt' stand for in an interaction diagram?

- A) Optimized
- B) Optional
- C) Option
- D) Operation

(9) Which architectural structure for WebApps is similar to a tutorial or e-book presentation?

- A) Grid
- B) Linear
- C) Hierarchical
- D) Network

(10) Which diagram shows the flow from activity to activity, emphasizing the many decision paths that can be taken?

- A) Sequence Diagram
- B) Statechart Diagram
- C) Activity Diagram
- D) Class Diagram

Section D

Q.-4. Decide whether the statements given below are True or False.

(10)

- (1) Inheritance defines an "is-a" relationship between a superclass and a subclass.
- (2) In the Structured Approach, software reuse is easily possible.
- (3) Domain Analysis is the first phase of Domain Engineering and focuses on systematic software reuse.
- (4) In CRC modeling, a responsibility is defined as anything the class knows or does.
- (5) Cardinality specification of "many" is expressed as one or more occurrences.
- (6) Functional independence is assessed using two criteria: Cohesion and Coupling.
- (7) Coupling is a measure of the functional strength of a single module.
- (8) A Guardian Object acts as a gatekeeper for a system resource, such as a disk drive.
- (9) In MVC architecture, the Controller manages access to the model and the view.
- (10) Synchronous messages wait for a reply before the interaction moves forward.
