K. K. Wagh Institute of Engineering Education & Research, Nashik

(An Autonomous Institute From A.Y. 2022-23)

WINTER-2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:VII
Class:FINAL YEAR (B.TECH)	Program:B.Tech
Branch Code:ADS	Pattern:2022
Name of Course:Software Architecture and Design Pattern	Course Code:ADS224006C
Max. Marks:30	Duration: 1:15 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 2 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

		Marks	CO
Question No. 1			
1	Explain Quality Attributes in the context of software architecture. Why are they important?	(3)	CO1
Question No. 2			
2	Demonstrate Service-Oriented Architecture (SOA) in detail suitable example.	(3)	CO2
Question No. 3			
3.a)	A PaymentService class directly creates concrete payment classes (CreditCardPayment,PayPalPayment etc.); apply suitable SOLID principles to redesign this so that new payment methods can be added without modifying PaymentService.	(4)	CO3
	OR		
3.b)	In a graphics application that requires a single global configuration object and flexible creation of different Shape objects (Circle,Rectangle etc.) at runtime, apply the Singleton and Factory Method patterns appropriately and illustrate your design with suitable examples.	(4)	CO3
3.c)	Interpret the Composite pattern. How does it differ from the Decorator pattern?	(4)	CO3
	OR		
3.d)	Interpret the State pattern with a real-world example.	(4)	CO3
Question No. 4			
4.a)	Differentiate between the Logical View and the Development View of the 4+1 model with suitable examples.	(4)	CO4
	OR		
4.b)	Demonstrate how quality attributes (like performance, security, availability) are analyzed using ATAM.	(4)	CO4
4.c)	A distributed banking application experiences performance bottlenecks and concurrency issues under heavy load. Analyse how the Process View in the 4+1 architectural model helps identify and address these problems, and explain which aspects of the system you would focus on in this view.	(4)	CO4

OR

4.d)	Given a large, safety-critical software system (e.g., air traffic control or medical monitoring), analyze how different essential features of Architecture Description Languages (ADL's)—enable more effective architectural design and analysis in terms of correctness, modifiability, and verification.	(4)	CO4

Question No. 5

5.a)	Interpret is Pattern-Oriented Software Architecture (POSA)?	(4)	CO5

OR

5.b)	Give examples of how IoT systems use design patterns.	(4)	CO5
5.c)	Investigate with an example how multiple design patterns can be integrated in a single system.	(4)	CO5

OR

5.d)	How are design patterns used in Cloud computing architectures?	(4)	CO5

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