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	Program:B.Tech
Branch Code:INT	Pattern:2022
Name of Course:Distributed Computing and System	Course Code:INT224001
Max. Marks:60	Duration:2.30 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			
1a)	Using a suitable example, explain the working of **XML-based middleware**. How does XML improve interoperability in distributed applications?	(6)	CO1
Question No. 2			
2a)	Explain the need for **clock synchronization** in distributed systems. Discuss the working of **logical clocks** and compare them with physical clock synchronization techniques	(6)	CO2
Question No. 3			
3a)	Explain **primary-based consistency protocols** with an example.	(5)	CO3
	OR		
3b)	What is **content replication and placement**? Discuss the factors that influence content placement.	(5)	CO3
3c)	The platform uses **checkpointing and message logging** for recovery. Explain how these recovery mechanisms help restore the system state after a crash or failure.	(5)	CO3
	OR		
3d)	A banking application requires consistent account updates across different branches. Describe how **distributed commit** ensures reliable transaction completion	(5)	CO3
3e)	What is **distributed commit**? Explain its need in distributed systems	(6)	CO3
	OR		
3f)	Explain the **recovery mechanisms** in distributed systems. Discuss both **check-pointing** and **message logging** techniques	(6)	CO3
Question No. 4			
4a)	List and explain the **characteristics of multimedia data** in distributed systems.	(5)	CO4
	OR		
4b)	Describe the working of the **Apache Web Server** in distributed environments.	(5)	CO4

4c)	Explain the architecture of **traditional web-based systems**.	(5)	CO4

OR

4d)	Outline the architecture of X.500 application level directory service standard.	(5)	CO4
4e)	A global software company needs a unified directory for employees to authenticate and locate resources. Explain how **X.500 or Global Name Service** can solve this problem	(6)	CO4

OR

4f)	Multiple students accessing the same educational site at a university notice faster performance. Explain how **web proxy caching** contributed to this improvement	(6)	CO4

Question No. 5

5a)	Discuss the key features of the **Chorus operating system**.	(5)	CO5

OR

5b)	Write a short note on **wearable devices** and their relevance in pervasive computing	(5)	CO5
5c)	An automobile company uses embedded devices inside cars to monitor engine health and driving patterns. Explain how **embedded appliances** support such distributed monitoring.	(5)	CO5

OR

5d)	A scientific research lab wants to run large-scale parallel simulations. Explain how **PVM** can be used to integrate multiple computers to act as a single parallel system	(5)	CO5
5e)	What are the components of web services. Explain the need and use of web services with suitable examples	(6)	CO5

OR

5f)	Discuss the evolution of the World Wide Web (WWW) from 1.0 to 3.0. Compare their characteristics, technologies, and use cases	(6)	CO5

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