Question Paper

MANIPAL ACADEMY OF HIGHER EDUCATION

SIXTH SEMESTER B.TECH MAKEUP SEMESTER EXAMINATIONS, June/July 2023

DISTRIBUTED SYSTEMS [CSE 3251]

Marks: 50   **Duration: 180 mins.**

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

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1)	A)	Scaling out is a mechanism in which the distributed system is expanded by essentially deploying more machines. Describe the three techniques for performing scaling out in distributed systems.	(4)
	B)	In a resource based architecture describe the four characteristics of RESTful architectures.	(3)
	C)	Deciding on software components, their interaction, and their placement leads to an instance of a software architecture which is also known as a system architecture. Illustrate the centralized organization of system architecture in a distributed systems.	(3)
2)	A)	Explain the method of clock synchronization in wireless networks. With a diagram, explain how critical path is calculated.	(4)
	B)	Using Unix make program as an example, explain what will happen if clocks are not synchronized in a distributed system. Illustrate with a diagram.	(3)
	C)	Lamport's clocks do not capture causality. Illustrate this with an example.	(3)
3)	A)	Explain the different types of communication. How does synchronization take place for each of the communication? Explain with a diagram.	(4)
	B)	How epidemic algorithm is used to spread information in large-scale distributed systems? What are the different types of propagation model of information dissemination model. Explain in detail.	(3)
	C)	How iterative and recursive name resolution are implemented? Which name resolution method is more effective with respect to communication cost. Discuss with a necessary diagram.	(3)
4)	A)	Assume chord ring with 5 highlighted nodes 1, 3, 6, 8 and 10 which is shown in the below Figure 1. Form a finger table with 2 entries per table for the highlighted nodes. Now try to resolve key 9 from node 1. Illustrate the procedure of resolving key 9 with necessary explanation.	(4)
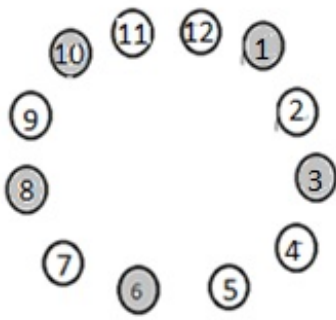
Figure 1: Chord System.

B)	What is hierarchical approach in naming? How look up request is performed to find a location in a hierarchically organized location service? Explain with a necessary diagram.	(3)
C)	Explain three different types of replicas.	(3)

5)   How is Eventual Consistency defined? Illustrate with an example.   (4)

A)

B)	How are Local write Protocols defined, in Consistency and Replica? Illustrate with an example.	(3)
C)	Illustrate the use of Map Reduce Function? Show a Block Diagram for the same.	(3)

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