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**Question Paper Code: U6F03**

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2024

Sixth Semester

Computer Science and Design

**21UCD603 - DISTRIBUTED COMPUTING**

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (10 x 2 = 20 Marks)

1. Differentiate buffering and coaching? CO1-U
2. Define transparency. What its type? CO1-U
3. Write short notes on happen-before relation? CO1-U
4. If the two events e1 and e2 of two different processes occur at same time, independently. What kind of relationship exists between e1 and e2? CO2-App
5. Name the two types of message used in Richart-Agarwala's algorithms. CO1-U
6. Node B receives a broadcast message from node A with timestamp vector  $T = [2, 1, 3, 4]$ . Node B has timestamp vector  $V = [3, 2, 4, 1]$ . Use Suzuki Kasami's Broadcast Algorithm to determine if node B should delay the message or deliver it immediately. CO2-App
7. State the use of rollback recovery. CO1-U
8. Define consistent cut. CO1-U
9. Explain NIST definition of cloud computing? CO1-U
10. Draw a basic cloud deployment model and cloud service model? CO2-App

PART – B (5 x 16= 80 Marks)

11. (a) Explain how a parallel system differs from a distributed system? CO1-U (16)  
Or  
(b) (i) What is distributed system? What is the need of distributed system? CO1-U (16)  
(ii) Explain global state of distributed system?
12. (a) During a synchronization cycle, the Madurai master node polls the CO2-App (16)

Virudhunagar and Tirunelveli offices' servers for their local times. Here are the times reported and the round-trip delay observed for each communication:

•Madurai (Master): 10:00:00 AM (reference time, no delay needed)

•Virudhunagar: 3:00:15 PM, with a round-trip delay of 200ms

•Tirunelveli: 11:00:10 PM, with a round-trip delay of 300ms.

Calculate the average time, considering the Madurai delays.

Or

- (b) The Chandy-Lamport algorithm can be integrated into a distributed supply chain management system to capture a consistent snapshot of inventory levels, order statuses, and logistics data across distributed warehouses and distribution centers. Discuss how the algorithm can facilitate real-time inventory management and order tracking. CO2-App (16)
13. (a) Explain RicartAgarwala Algorithm with an example. CO1-U (16)
- Or
- (b) (i) Explain about the Chandy-Misra-Haas algorithm for the AND model. CO1-U (16)
- (ii) Chandy-Misra-Haas algorithm for the OR model.
14. (a) Discuss the issues and failure recovery with an example. CO1-U (16)
- Or
- (b) (i) Discuss about the synchronous check pointing and recovery. CO1-U (16)
- (ii) Details about the rollback recovery algorithm.
15. (a) Discuss about cloud computing operations in any large e-commerce platform like Amazon.com and explain their service in detail. CO2-App (16)
- Or
- (b) Suppose you're tasked with designing a load balancing solution for a high-traffic e-commerce website. What factors would you consider, and how would you approach the design process? CO2-App (16)