Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 40927

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define concurrency and granularity.

2. What is meant by global state in a distributed system?

3. List down the modifications that need to be done to the Chandy–Lamport snapshot algorithm so that it records a strongly consistent snapshot (i.e., all channel states are recorded empty).

4. Distinguish casual order and total order in group communication.

5. List down the three requirements of mutual exclusion algorithms.

6. Mention the two issues with deadlock handling.

7. List down any four issues in failure recovery.

8. What is meant by cascaded rollback?

9. List down any four salient features of cloud computing.

10. Distinguish scalability and elasticity in cloud computing.

PART B — (5 × 13 = 65 marks)

11. (a) Write a detailed note on the various primitives for distributed communication.

Or

(b) Prove that in a distributed computation, for an event, the surface of the past cone (i.e., all the events on the surface) form a consistent cut. Does it mean that all events on the surface of the past cone are always concurrent? Give an example to make your case.

12. (a) (i) How does local state contribute to the global state in distributed system? (7)

(ii) Explain snapshot algorithm. (6)

Or

(b) (i) How does clock synchronized physically? Explain it. (7)

(ii) Illustrate causal order and total order with example. (6)

13. (a) Explain with example the response of Ricart–Agrawala algorithm with a critical section.

Or

(b) Compare and contrast Chandy–Misra–Haas algorithm for the AND model and OR model.

14. (a) Explain in detail consensus algorithm for Byzantine failures.

Or

(b) Write a detailed note on log based rollback recovery using an algorithm.

15. (a) Explain in detail the various storage services in cloud computing.

Or

(b) Explain in detail software defined networking with architecture.

PART C — (1 × 15 = 15 marks)

16. (a) Illustrate the various Distributed multicast algorithms at the network layer using a simulated environment.

Or

(b) Illustrate centralized and distributed algorithms for total order in message and group communication systems.

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