Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 80451

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024.

Sixth Semester

Computer Science and Engineering

CS 8603 – DISTRIBUTED SYSTEMS

(Common to: Artificial Intelligence and Data Science)

(Regulations 2017)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What are the Advantages of distributed Systems?

2. What are types of Communication in distributed Systems?

3. What are the forms of message ordering paradigms?

4. What are the two phases in obtaining a global snapshot?

5. Define the term Distributed Mutual Exclusion.

6. What do you understand the term Throughput?

7. State the role of Index–based check pointing.

8. What are the types of rollback–recovery protocols?

9. What are the tasks performed by routing overlay?

10. What are the two steps involved in chord protocol?

PART B — (5 × 13 = 65 marks)

11. (a) Discuss in detail about application domains where distributed system is
         applied?   (13)

Or

    (b) (i)   Discuss about load balancing in detail.   (7)

         (ii) Describe Performance metrics in Distributed System.   (6)

12. (a) (i) Discuss about FIFO and non–FIFO executions. (6)

(ii) Discuss in detail about causally ordered executions. (7)

Or

(b) Define group communication. What are the applications of group communication? Describe the programming model for group communication. (2+5+6)

13. (a) Describe the distributed deadlock detection algorithms in detail. (13)

Or

(b) Explain about the Lamport's distributed mutual exclusion algorithm. (13)

14. (a) (i) What are min–process check pointing algorithms? Explain it detail. (7)

(ii) Describe about deterministic and non–deterministic events. (6)

Or

(b) Explain agreement in (message–passing) synchronous systems with failures. (13)

15. (a) Point out tapestry P2P overlay network and its routing with an example. (13)

Or

(b) State about the consistency models.

(i) Entry Consistency. (7)

(ii) Releases consistency. (6)

PART C — (1 × 15 = 15 marks)

16. (a) Show that in the Ricart–Agrawala algorithm the critical section is accessed in increasing order of timestamp. Does the same hold in Maekawa's algorithm? Justify. (15)

Or

(b) Consider a distributed system where every node has its physical clock and all physical clocks are perfectly synchronized. Develop an algorithm to record global state assuming the communication network is reliable. (15)