## 2023

ADVANCED OPERATING SYSTEM

Full Marks : 100

Time : Three hours

The figures in the margin indicate full marks for the questions.

Answer any five questions.

1. a) Define a Distributed System. Explain the common network models used in Distributed System. 10

    b) Explain in details about RPC with a suitable example. 10

2. Explain Byzantine Generals Problem. Explain with an example its significance in distributed system. 20

3. Explain Dining Philosopher Problem. Describe a deadlock and starvation free solution to Dining Philosopher Problem. 20

4. a) What is Deadlock? What are the Deadlock Prevention Strategies adopted by OS? 10

    b) Define FIFO, Causal, Total Order and FIFO Total Order Broadcast. Include diagram. 10

5. a) Define Idempotent Request. Explain with an example significance of Idempotent Request in Distributed System. 5

    b) Briefly explain Causality and Happens Before relationship. 5

    c) Explain with an example comparison of Round Robin scheduling algorithm and FCFS scheduling algorithm 10

6. Given the sequence of messages in the following execution, show the Lamport timestamps and Vector timestamps at each send or receive event. 10+10=20
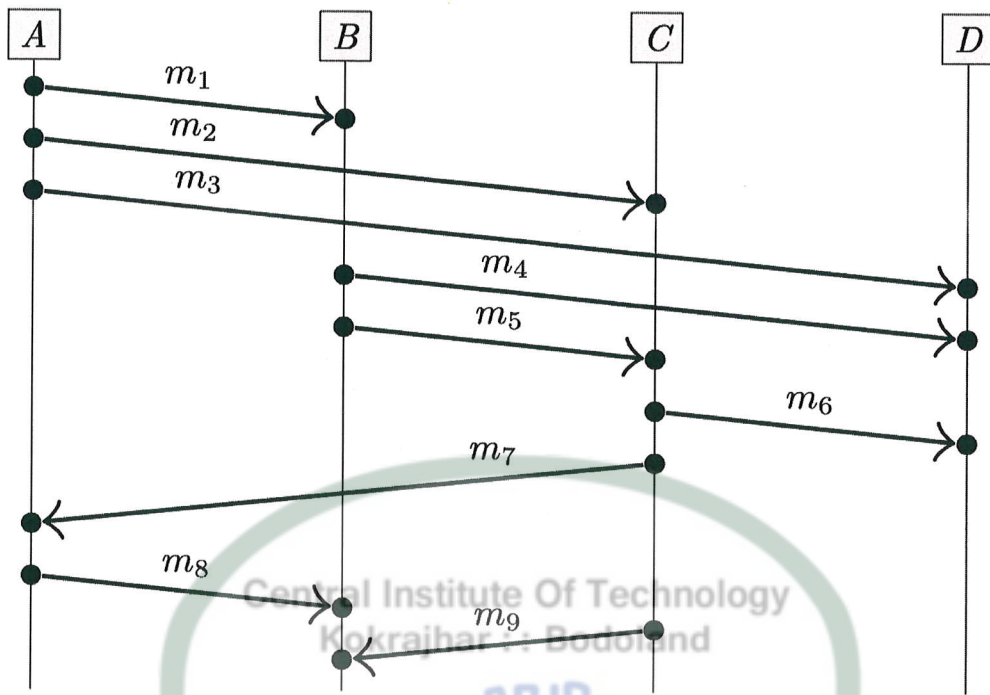
7.   Write Short Notes on: (Any Two)   10+10

   a) Network Time Protocol

   b) Quorum

   c) Virtual Memory

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