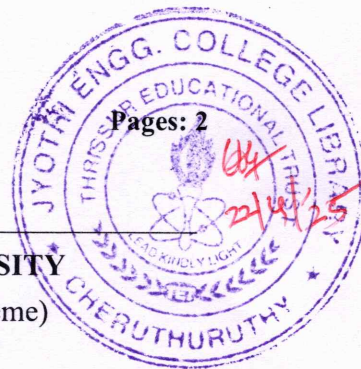


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Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**

B.Tech S8 (R, S) Exam (FT / PT) April 2025 (2019 Scheme)

**Course Code: CST402**

**Course Name: DISTRIBUTED COMPUTING**

**Max. Marks: 100**

**Duration: 3 Hours**

**PART A**

*Answer all questions, each carries 3 marks.*

Marks

- |    |  |     |
|----|--|-----|
| 1  | List the characteristics of distributed system.                              | (3) |
| 2  | Define Causal precedence relation  | (3) |
| 3  | What are leader election algorithms? Name any two                            | (3) |
| 4  | Define logical clock   | (3) |
| 5  | What are the performance evaluation metrics of a mutual exclusion algorithm? | (3) |
| 6  | List out the strategies for handling deadlocks in a distributed environment  | (3) |
| 7  | State the disadvantages of distributed shared memory                         | (3) |
| 8  | What are checkpoints?  | (3) |
| 9  | Define Byzantine agreement problem.  | (3) |
| 10 | Write the features of Google File System.                                    | (3) |

**PART B**

*Answer any one full question from each module, each carries 14 marks.*

**Module I**

- |    |  |     |
|----|--|-----|
| 11 | a) Explain the algorithmic challenges of designing a distributed system. | (7) |
|    | b) Compare and contrast physical and logical concurrency                 | (7) |

**OR**

- |    |   |     |
|----|---|-----|
| 12 | a) Explain in detail about the past and future cones of an event. | (6) |
|    | b) Explain the applications of distributed computing              | (8) |

**Module II**

- |    |  |     |
|----|--|-----|
| 13 | a) What are the basic properties of scalar time?         | (6) |
|    | b) Illustrate bully algorithm for electing a new leader. | (8) |

**OR**

- |    |  |     |
|----|--|-----|
| 14 | a) Discuss in detail about chandy lamport algorithm.                             | (8) |
|    | b) Illustrate the working of spanning tree based termination detection algorithm | (6) |



**Module III**

- 15 a) Explain Lamport's algorithm for mutual exclusion (8)  
b) Explain in detail about deadlock handling strategies in a distributed environment (6)

**OR**

- 16 a) Explain with example, how wait-for-graphs can be used in deadlock detection. (8)  
b) Explain Ricart-Agrawala algorithm with example (6)

**Module IV**

- 17 a) Explain pessimistic and optimistic logging (6)  
b) Show Lamport's Bakery algorithm for shared memory mutual exclusion, satisfy the three requirements of critical section problem (8)

**OR**

- 18 a) Differentiate consistent and inconsistent state with example. (6)  
b) Explain check point based rollback recovery (8)

**Module V**

- 19 a) Explain consensus algorithm for crash failures under synchronous systems. (7)  
b) Explain SUN -NFS Architecture (7)

**OR**

- 20 a) Explain file service architecture in detail (8)  
b) Discuss the requirements of a distributed file system. (6)

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