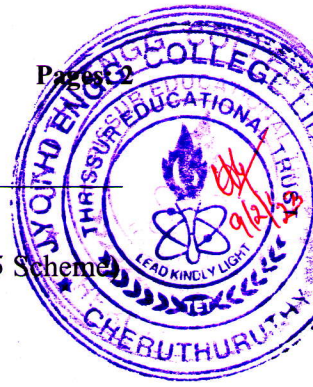Reg No.:_____      Name:_____

# APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
Seventh Semester B.Tech Degree (S, FE) Examination January 2023 (2015 Scheme)

## Course Code: CS407
## Course Name: DISTRIBUTED COMPUTING

Max. Marks: 100                                  Duration: 3 Hours

### PART A
*Answer all questions, each carries 4 marks.*

Marks

| | | |
|---|---|---|
| 1 | List any 4 issues in the design of a distributed system. | 4 |
| 2 | Explain the significance of middleware in distributed systems. | 4 |
| 3 | A search engine is a web server that responds to client requests to search in its stored indexes and (concurrently) runs several web-crawler tasks to build and update the indexes. What are the requirements for synchronization between these concurrent activities? | 4 |
| 4 | Explain the request-reply protocol with an example | 4 |
| 5 | What is a file group? How will you generate a unique identifier for a file group? | 4 |
| 6 | What do you mean by Vice and Venus in AFS? What are their roles? | 4 |
| 7 | What is the purpose of using Locks in transactions? Describe two-phase locking. | 4 |
| 8 | How serial equivalence helps to avoid 'The Lost Update' problem. Give proper examples. | 4 |
| 9 | Illustrate the working of the central server algorithm with a diagram. | 4 |
| 10 | Evaluate the performance of Maekawa's voting algorithm. | 4 |

### PART B
*Answer any two full questions, each carries 9 marks.*

| | | | |
|---|---|---|---|
| 11 | a) | Distinguish between the mini computer model and work station model. | 4 |
| | b) | "The absence of these two transparencies most strongly affects the utilization of distributed resources." Identify and explain the above two types of transparencies with examples. | 5 |
| 12 | a) | Compare client-server architecture with peer-to-peer architecture. | 3 |
| | b) | Explain Distributed Computing as a Utility. | 3 |
| | c) | Write notes on mobile and ubiquitous computing. | 3 |
| 13 | a) | Explain the different categories of failures in a distributed environment. | 5 |
| | b) | Distinguish between Omission Failures and Arbitrary failures. | 4 |

## PART C
*Answer any two full questions, each carries 9 marks.*

14  a)  Using a neat diagram, explain the steps in establishing a Skype connection.   6

    b)  Explain IP Multicast.   3

15  a)  Explain NFS Architecture with a neat diagram.   7

    b)  Explain the format of Remote Object Reference.   2

16  a)  Explain the Remote Procedure Call mechanism   6

    b)  Describe File Attribute Record Structure.   3

## PART D
*Answer any two full questions, each carries 12 marks.*

17  a)  Explain the lost update and inconsistent retrievals problems in concurrent transactions with the help of examples.   6

    b)  How the optimistic concurrency control to the serialization of transactions avoids drawbacks of locking   6

18  a)  Write an algorithm to implement mutual exclusion between N processes that is based upon multicast and logical clocks. Illustrate the algorithm using a situation involving three processes p1, p2, and p3.   6

    b)  Explain 'dirty read' and 'premature write' problems associated with transactions with suitable examples.   6

19  a)  Explain Ricart and Agrawala's multicast based mutual exclusion algorithm   6

    b)  Illustrate bully algorithm for election with an example.   6

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