

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S7 (S, FE) / S7 (PF) (S,FE) Examination May/June 2024 (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

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| 1 | Explain how multimedia services are supported in distributed systems. | (4) |
| 2 | What is meant by a distributed system? Explain its characteristics. | (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 | What are the two variants of the interaction model in distributed systems? On what points do they differ? | (4) |
| 5 | How interprocess communication is achieved in distributed system? | (4) |
| 6 | Discuss how NFS handles the condition when
(a) $T - T_c > t$
(b) $T - T_c = 0$ and
(c) $T_{mclient} = T_{mserver}$. | (4) |
| | Brief on various events that can take place for (a) and (b) | |
| 7 | State the rules for committing of nested transactions. | (4) |
| 8 | What are the main two problems associated with aborting transactions and how it is resolved | (4) |
| 9 | What are the criteria for evaluating the performance of a mutual exclusion algorithm? | (4) |
| 10 | Evaluate the performance of Maekawa's voting algorithm with respect to fault tolerance. | (4) |

PART B

Answer any two full questions, each carries 9 marks.

- 11 a) With a neat diagram, explain workstation server model. Discuss its advantages over workstation model. (5)
- b) Explain briefly about the following issues in designing a distributed operating systems. (4)
- a. Reliability
 - b. Flexibility
- 12 a) Classify the architectural patterns used in distributed system. (5)
- b) List and explain the different types of communication paradigms used within distributed systems. (4)
- 13 a) What are the different placement strategies followed in distributed systems? (5)
- b) Explain briefly the occurrences of main types of threats to the processes and the communication channel that occur in the internet. (4)

PART C

Answer any two full questions, each carries 9 marks.

- 14 a) Explain the implementation of RPC mechanism with a neat diagram. (5)
- b) What are the main four tasks involved in a group communication? (4)
- 15 a) Briefly Explain about the client caching and server caching mechanism used in NFS. (5)
- b) Explain about Directory service operations in file service architecture. (4)
- 16 a) Briefly explain different types of navigations used for name resolution. (5)
- b) What are the issues related to UDP interprocess communication? (4)

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) Describe a deadlock detection scheme for a single server with an example. (6)
- 18 a) Write an algorithm to implement mutual exclusion between N processes that is based upon multicast and logical locks. Illustrate the algorithm using the situation involving three processes p1, p2 and p3. (12)
- 19 a) Differentiate backward and forward validation in optimistic concurrency control. (6)
- b) Explain ring-based algorithm with suitable example. Compare central server algorithm and ring-based algorithm. (6)
