

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MARCH 2020

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 | Define mobile agents. How this will create security threats. | (4) |
| 2 | Outline the layered and tiered architectural patterns used in distributed systems. | (4) |
| 3 | Distinguish between the two variants of the interaction model in distributed systems. | (4) |
| 4 | Explain the three RPC call semantics. | (4) |
| 5 | What is file group? How will you generate a unique identifier for a file group? | (4) |
| 6 | Explain the mount service in NFS. | (4) |
| 7 | Suppose that there are 100 items currently in a stock. Given two transactions U and V as below. Explain the inconsistent retrievals problem in this scenario and propose a solution for that. | (4) |

| U | V |
|--------------------|--------------------------|
| Purchase 200 items | Read item count in Stock |
| Sell 50 items | |

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|----|---|-----|
| 8 | Explain two version locking. | (4) |
| 9 | Define mutual exclusion and summarize its three essential requirements. | (4) |
| 10 | Evaluate the performance of Maekawa's voting algorithm. | (4) |

PART B

Answer any two full questions, each carries 9 marks.

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| 11 | a) "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. | (4) |
| | b) Compare workstation model with workstation-server model. | (5) |
| 12 | a) Distinguish between mobile computing and ubiquitous computing. | (4) |
| | b) Compare client-server architecture with peer to peer architecture. | (5) |
| 13 | a) Distinguish between Omission Failures and Arbitrary failures. | (4) |

- b) Identify the failure category in the following events and define it: (3)
- i. Dropped messages
 - ii. Corrupt/duplicate data
 - iii. Delayed transmission
- c) Explain the significance of middleware in distributed systems (2)

PART C

Answer any two full questions, each carries 9 marks.

- 14 a) With a neat architecture, explain the steps in establishing a Skype connection. (6)
- b) Describe the features of group communication. (3)
- 15 a) Explain IP multicast (4)
- b) Illustrate the architecture and implementation details of Andrew File System. (5)
- 16 a) Explain the role of virtual file system module (VFS) in Sun NFS. (4)
- b) Sketch the distributed file service architecture and explain its components. (5)

PART D

Answer any two full questions, each carries 12 marks.

- 17 a) Explain how the time-stamp approach helps in overcoming the lost-update problem. Discuss how the inconsistencies are removed. (6)
- b) Define deadlock and explain how deadlocks can be detected and prevented. (6)
- 18 a) Explain the use of locks in two phase locking and strict two phase locking. (6)
- b) Evaluate the performance of ring based algorithm for mutual exclusion. (6)
- Give an example for the execution of the algorithm to show that processes are not necessarily granted entry to the critical section in happened-before order.
- 19 a) Illustrate bully algorithm for election with an example. (8)
- b) Outline two scenarios where the election condition E1 is broken in case of Bully algorithm. (4)
