Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

SEVENTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), DECEMBER 2019

Course Code: CS407

Course Name: DISTRIBUTED COMPUTING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer all questions, each carries 4 marks. Marks

1 Explain network transparency. The e-mail addresses ensures network transparency, justify. (4)

2 Compare tightly coupled and loosely coupled systems with neat diagrams. (4)

3 Illustrate the following placement strategies used in a distributed system. (4)

i. mapping of services to multiple servers / proxy servers
ii. mobile code

4 What impact does the introduction of overlay networks have on the traditional Internet architecture, and in particular on the programmer's conceptual view of the Internet? (4)

5 Explain the directory service and its interface operations in a file service architecture. (4)

6 Illustrate the iterative navigation process in name resolution with a neat diagram. (4)

7 The operation create inserts a new bank account at a branch. The transactions T and U are defined as follows: (4)

T: *aBranch.create("Z");*

U: *z.deposit(10); z.deposit(20).*

Assume that Z does not yet exist. Assume also that the deposit operation does nothing if the account given as the argument does not exist. Consider the following interleaving of transactions T and U:

T	U
	z.deposit(10);
aBranch.create(Z);	
	z.deposit(20);

State the balance of Z after their execution in this order. Are these consistent with serially equivalent executions of T and U?

8 What is a deadlock? Illustrate the various ways of detecting deadlock in a (4)

distributed environment.

9 Illustrate the working of central server algorithm with a diagram. (4)

10 Explain the case of deadlock in Maekawa's voting algorithm. (4)

PART B

Answer any two full questions, each carries 9 marks.

11 a) Illustrate the processor-pool model with a neat diagram. How is it different from workstation-server model? (5)

b) Describe the heterogeneity and scalability issues in distributed computing. (4)

12 a) Explain distributed computing as a 'Utility'. (4)

b) Identify the different threats to communication channels and explain different mechanisms to overcome that. (5)

13 a) Explain the different categories of failures in a distributed environment. (6)

b) Outline three specific and contrasting examples of the increasing levels of heterogeneity experienced in contemporary distributed systems. (3)

PART C

Answer any two full questions, each carries 9 marks.

14 a) With a neat diagram, explain the tasks in group membership management. (5)

b) Describe the multicast support provided in IPv4. (4)

15 a) With a neat diagram, illustrate the implementation of RPC. (5)

b) Summarize the distributed file system requirements. (4)

16 a) Sketch the architecture of Sun NFS and explain the role of different components. (6)

b) Distinguish between whole file serving and whole file caching in Andrew file system. (3)

PART D

Answer any two full questions, each carries 12 marks.

17 a) Outline the lock implementation in distributed environment. (6)

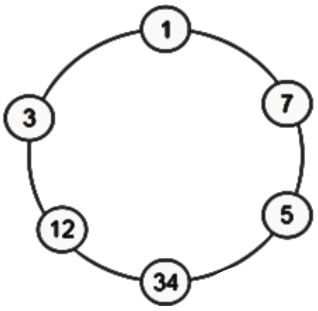
b) Explain dirty read and premature write problems associated with transactions with suitable examples. (6)

18 a) What are nested transactions? Summarize the rules for committing of nested transactions. (5)

b) Explain the steps in Maekawa's voting algorithm. (7)

19 a) In the ring topology shown below, if process with identifier 7 initiates election, explain the election process and show the modifications happening to the election message as it passes through all the processes. (8)

How many election and elected messages will be passed so that the coordinator be elected and known to all the processes?



b) Examine whether the Bully algorithm meets the necessary conditions for election. (4)

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