Sub Code:NCS701

Paper Id: 110713 Roll No:

B. TECH.
(SEM VII) THEORY EXAMINATION 2019-20
DISTRIBUTED SYSTEMS

Time: 3 Hours ***Total Marks: 100***

Note: Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. 2 x 10 = 20

a. Illustrate the concept of resource sharing in world wide web.
b. Explain global state and distributed debugging.
c. Define mutual exclusion in distributed system.
d. What is the difference between deadlock avoidance and deadlock prevention?
e. Discuss the application of agreement problem.
f. State Byzantine agreement problem.
g. Describe orphan messages and loss messages.
h. Distinguish between fault and failure.
i. Differentiate between 2PL and strict 2PL.
j. Write short note on replication.

SECTION B

2. Attempt any *three* of the following: 10x3=30

a. Explain in detail various fundamental system model of a distributed system.
b. What are the differences between resource and communication deadlocks? Discuss salient features of a path pushing algorithm and explain how wait for dependencies are propagated in the form of paths.
c. Discuss how the efficiency of distributed shared memory system depends on the size of granularity and protocol used for page replacement.
d. What is voting protocol? Discuss the majority based dynamic voting protocol.
e. Compare and contrast between different concurrency control techniques for transaction.

SECTION C

3. Attempt any *one* part of the following: 10x1=10

a. What are design issues of Distributed system? Also discuss challenges in Distributed system.
b. What is Lamport's Logical clock? For Lamport clock system prove that for any two events 'p' & 'q' if $p \rightarrow q$, then $C(p)<C(q)$, but reverse is not true.

4. Attempt any *one* part of the following: 10x1=10

a. Explain the classification of distributed Mutual exclusion? Describe the requirements of mutual exclusion theorem in distributed system.
b. What do you mean by deadlock detection? Explain edge chasing algorithm for deadlock detection in detail.

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5. Attempt any *one* part of the following: 10x1=10

a. What do you mean by distributed file system? Explain three mechanisms used for implementing Distributed file system.

b. What do you mean by agreement protocol? List all the agreement protocols and the difference between them.

6. Attempt any *one* part of the following: 10x1=10

a. Differentiate between forward and backward recovery. Explain Orphan Message and Domino effect with example.

b. Discuss any checkpoint and recovery algorithm that takes a consistent checkpoint and avoids livelock problems.

7. Attempt any *one* part of the following: 10x1=10

a. Differentiate between Flat and Nested transactions. Also explain Timestamp ordering for transaction management.

b. Attempt any two parts of the following:
(i) Optimistic concurrency control
(ii) Transactions with replicated data
(iii) Distributed deadlocks

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