PAPER ID-310329

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM VII) THEORY EXAMINATION 2023-24
DISTRIBUTED SYSTEMS

TIME: 3 HRS **M.MARKS: 100**

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

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

Q no.	Question
a.	Describe distributed systems. Give some examples.
b.	Illustrate that the vector clocks are more suitable than Lamport's logical clock for a Distributed system.
c.	Explain the token based algorithm.
d.	Differentiate between resource and communication deadlock.
e.	Explain different Fundamental models in distributed system.
f.	Define Global State and Synchronization.
g.	Describe deadlock resolution.
h.	Discuss forward and backward recovery in distributed systems.
i.	List basic, multi version and conservative timestamp ordering algorithm in increasing order of transaction abort.
j.	Differentiate between flat and nested transactions.

SECTION B

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

a.	Explain the limitations of distributed system. Describe major problems encountered due to these limitations.
b.	Describe phantom deadlock. Describe the algorithm which can detect phantom deadlock.
c.	Compare various concurrency control techniques for transactions.
d.	Illustrate agreement protocols. Discuss the general system model where agreement protocols are used. Give the applications of agreement protocol.
e.	Differentiate between forward and backward recovery. Explain Orphan message and Domino effect with example.

SECTION C

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

a.	Discuss fundamental and architectural model of distributed system.
b.	Discuss the concepts in Message Passing Systems. Describe and compare causal order, total order, total causal order.

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

a.	Explain various deadlock handling strategies in distributed system. Also differentiate among centralized, distributed and hierarchical deadlock detection strategies in distributed system.
b.	Explain the path pushing algorithm for distributed deadlock detection algorithm.

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

a.	Describe Byzantine agreement problem, and explain its solution. Show that Byzantine agreement cannot always be reached among four processors if two processors are faulty.
b.	Write the algorithm for implementation of distributed shared memory. Explain various design issues in distributed shared memory.

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

a.	Describe recovery. Differentiate between fault and failure. Explain various problems in a fault tolerant system.
b.	Describe Checkpoints. Explain the methods of obtaining consistent Checkpoints. Discuss the requirement of inserting checkpoints in message passing in distributed system.

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

a.	Describe various methods of concurrency control. Compare the methods of concurrency Control.
b.	Illustrate the following (i) Transaction Recovery (ii) Highly Available Services

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