PAPER ID-310615

Subject Code: RCS701

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

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

TIME: 3 HRS **M.MARKS: 70**

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

SECTION A

1. Attempt *all* questions in brief. 2 x 7 = 14

	a.	Provide two real-world examples of distributed systems.
	b.	State Mutual Exclusion Theorem.
	c.	Describe two common system models used in the context of distributed systems.
	d.	Define dynamic voting protocols
	e.	Compare and contrast two types of commit protocols used in distributed systems.
	f.	Define a transaction in the context of database systems.
	g.	Explain distributed deadlock.

SECTION B

2. Attempt any *three* of the following: 7 x 3 = 21

a.	Explain the fundamental models of distributed systems, focusing on client-server and peer-to-peer models.
b.	Explain the concept of token passing in distributed systems and how it is utilized in token-based mutual exclusion algorithms.
c.	Outline the basic classification of the Agreement Problem in distributed systems.
d.	Define backward recovery and forward recovery in the context of failure recovery in distributed systems.
e.	Describe the role of locks in concurrency control.

SECTION C

3. Attempt any *one* part of the following: 7 x 1 = 7

a.	Enumerate and elaborate on three limitations of distributed systems. Provide real-world examples to illustrate each limitation.
b.	Explain the concept of global state in a distributed system. How is it relevant to monitoring and managing the overall system behavior?

4. Attempt any *one* part of the following: 7 x 1 = 7

a.	Differentiate between resource deadlocks and communication deadlocks in a distributed system.
b.	Describe the concept of centralized deadlock detection in a distributed system.

5. Attempt any *one* part of the following: 7 x 1 = 7

a.	Describe one solution to the Byzantine Agreement Problem. What characteristics make this solution robust in the presence of faulty nodes?
b.	Define the Interactive Consistency Problem and explain its importance in distributed systems.

6. Attempt any *one* part of the following: 7 x 1 = 7

a.	Identify and explain two common issues in fault tolerance in distributed systems.
b.	Explain the concept of voting protocols in fault-tolerant systems.

7. Attempt any *one* part of the following: 7 x 1 = 7

a.	Define nested transactions and explain how they differ from flat transactions.
b.	Compare two common atomic commit protocols, Two-Phase Commit (2PC) and Three-Phase Commit (3PC).