Course Code: 25CS5802 **R25**

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR
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QUESTION BANK

Subject with Code: DISTRIBUTED OPERATING SYSTEMS (25CS5802)
Course & Branch: M.TECH CSE

Year &Sem: I-M.TECH & I-Sem **Regulation:** R25

UNIT – I
Architectures & Synchronization in Distributed Systems

1		Define Distributed Systems and explain various distributed architectures.	**[L1] [CO1]**	**[10M]**
2		Discuss communication primitives and their role in distributed systems.	**[L2] [CO1]**	**[10M]**
3		Explain Lamport's logical clocks with a neat example.	**[L2] [CO1]**	**[10M]**
4		Illustrate the concept of vector clocks and causal ordering.	**[L3] [CO1]**	**[10M]**
5		Analyze the inherent limitations of distributed systems.	**[L4] [CO2]**	**[10M]**
6		Compare system architecture types: client-server, peer-to-peer, and hybrid.	**[L4] [CO2]**	**[10M]**
7	**a)**	Define Mutual Exclusion in distributed systems.	**[L1] [CO2]**	**[5M]**
	b)	Compare token-based and non-token-based mutual exclusion algorithms.	**[L4] [CO2]**	**[5M]**
8	**a)**	Explain global state and cuts in distributed computation.	**[L2] [CO3]**	**[5M]**
	b)	Describe termination detection algorithms.	**[L2] [CO3]**	**[5M]**
9		Discuss issues in designing distributed operating systems.	**[L4] [CO1]**	**[10M]**
10		Design a logical clock synchronization mechanism for a distributed environment.	**[L6] [CO4]**	**[10M]**

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UNIT – II
Deadlocks, Agreement Protocols & Resource Management

1		Define distributed deadlocks and explain their challenges.	**[L1] [CO1]**	**[10M]**
2		Discuss centralized, distributed, and hierarchical deadlock detection algorithms.	**[L2] [CO2]**	**[10M]**
3		Explain agreement protocols and the Byzantine generals' problem.	**[L2] [CO2]**	**[10M]**
4		Illustrate the architecture of a distributed file system.	**[L3] [CO3]**	**[10M]**
5		Analyze issues in deadlock detection and resolution.	**[L4] [CO3]**	**[10M]**
6		Compare different distributed deadlock control organizations.	**[L4] [CO3]**	**[10M]**
7	**a)**	Define log-structured file systems.	**[L1] [CO3]**	**[5M]**
	b)	Explain their advantages.	**[L2] [CO3]**	**[5M]**
8	**a)**	Describe agreement problem classifications.	**[L2] [CO2]**	**[5M]**
	b)	Explain an application of agreement algorithms.	**[L3] [CO2]**	**[5M]**
9		Evaluate solutions to the Byzantine agreement problem.	**[L5] [CO4]**	**[10M]**
10		Design an efficient distributed deadlock detection model.	**[L6] [CO5]**	**[10M]**

Course Code: 25CS5802 **R25**

UNIT – III
DISTRIBUTED SHARED MEMORY, SCHEDULING & FAULT TOLERANCE

1		Define Distributed Shared Memory and explain its architecture.	**[L1] [CO1]**	**[10M]**
2		Discuss memory coherence models in DSM.	**[L2] [CO2]**	**[10M]**
3		Explain load distributing algorithms in distributed scheduling.	**[L2] [CO3]**	**[10M]**
4		Illustrate task migration and its associated issues.	**[L3] [CO3]**	**[10M]**
5		Analyze failure recovery and fault tolerance mechanisms.	**[L4] [CO4]**	**[10M]**
6		Compare synchronous and asynchronous checkpointing.	**[L4] [CO4]**	**[10M]**
7	**a)**	Describe components of load-distributing algorithms.	**[L2] [CO3]**	**[5M]**
	b)	Explain stability issues.	**[L3] [CO3]**	**[5M]**
8	**a)**	Define backward error recovery.	**[L1] [CO4]**	**[5M]**
	b)	Explain consistent checkpoint sets.	**[L2] [CO4]**	**[5M]**
9		Evaluate performance of different DSM implementations.	**[L5] [CO5]**	**[10M]**
10		Design a load sharing strategy for a cloud-based distributed system.	**[L6] [CO6]**	**[10M]**

Course Code: 25CS5802 **R25**

UNIT – IV
PROTECTION, SECURITY & CRYPTOGRAPHY IN DISTRIBUTED SYSTEMS

1		Define protection and explain the access matrix model.	**[L1] [CO1]**	**[10M]**
2		Discuss authentication methods in distributed systems.	**[L2] [CO2]**	**[10M]**
3		Explain public key cryptography with an example.	**[L2] [CO3]**	**[10M]**
4		Illustrate safety issues in the access matrix model.	**[L3] [CO3]**	**[10M]**
5		Analyze differences between conventional and modern cryptography.	**[L4] [CO4]**	**[10M]**
6		Compare DES and public-key techniques.	**[L4] [CO4]**	**[10M]**
7	**a)**	Define multiple encryption.	**[L1] [CO3]**	**[5M]**
	b)	Explain its security benefits.	**[L2] [CO3]**	**[5M]**
8	**a)**	Define multiple encryption.	**[L1] [CO3]**	**[5M]**
	b)	Explain its security benefits.	**[L2] [CO3]**	**[5M]**
9		Evaluate advanced protection models in distributed systems.	**[L5] [CO5]**	**[10M]**
10		Design a secure distributed authentication framework.	**[L6] [CO6]**	**[10M]**

Course Code: 25CS5802 **R25**

UNIT – V
MULTIPROCESSOR OS & DISTRIBUTED DATABASE CONCURRENCY CONTROL

1		Explain multiprocessor system architectures.	**[L1] [CO1]**	**[10M]**
2		Discuss interconnection networks for multiprocessor systems.	**[L2] [CO2]**	**[10M]**
3		Describe operating system issues in multiprocessor systems.	**[L2] [CO2]**	**[10M]**
4		Illustrate hypercube architecture.	**[L3] [CO3]**	**[10M]**
5		Analyze distributed database systems.	**[L4] [CO4]**	**[10M]**
6		Compare lock-based and timestamp-based concurrency control.	**[L4] [CO4]**	**[10M]**
7	**a)**	Define serializability theory.	**[L1] [CO4]**	**[5M]**
	b)	Explain its significance.	**[L2] [CO4]**	**[5M]**
8	**a)**	Describe optimistic concurrency control.	**[L2] [CO4]**	**[5M]**
	b)	Explain its limitations.	**[L3] [CO4]**	**[5M]**
9		Evaluate replication strategies in distributed databases.	**[L5] [CO5]**	**[10M]**
10		Design a concurrency control model for a financial distributed system.	**[L6] [CO6]**	**[10M]**

Prepared By:

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PROFESSOR

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