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Bengaluru

Mid Term Examinations - October 2026

Date: 07/10/2026 **Time:** 09:30 AM - 11:00 AM

Course Code: CBC2509 **Course Name:** Consensus Algorithms and Network Design

Semester: Fifth Semester **Max. Marks:** 50 **Weightage:** 50%

CO - Levels	CO1	CO2
Marks	28	62

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	Define consensus in a blockchain network and list any two requirements it must satisfy.	2	CO1	BT1
2	Explain why is it difficult for a distributed consensus protocol to guarantee both strong consistency and high availability at the same time?	2	CO1	BT2
3	Describe permissioned blockchain with an example.	2	CO1	BT2
4	State any two advantages of Proof-of-Work (PoW) over Proof-of-Stake (PoS).	2	CO1	BT1
5	Explain federated consensus model with an example.	2	CO2	BT2

PART B : Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
6	Discuss the classification of blockchain networks on the basis of participation and access control & Explain permissioned, permissionless, and consortium networks with examples.	10	CO1	BT3
7	Correlate safety and liveness as requirements of a consensus protocol & Discuss how Byzantine faults threaten these requirements in a decentralized network.	10	CO1	BT4

PART C: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
8	Devise the Proof-of-Stake (PoS) consensus mechanism & Explain how validators are selected and rewarded, using Ethereum 2.0 as an example.	10	CO2	BT4
9	Articulate the working of the Proof-of-Work consensus mechanism, covering hash puzzles and mining-difficulty adjustment, with a suitable	10	CO2	BT3

PART D: Answer Any 1 Following Questions. 10 M

Q.N.	Questions	M	CO	BT
10	Examine the Byzantine Generals Problem and explain how Practical Byzantine Fault Tolerance (PBFT) addresses it.	10	CO2	BT4
11	Dissect Delegated Proof-of-Stake (DPoS) & Describe the role of elected delegates/witnesses in block validation and how DPoS differs from traditional PoS.	10	CO2	BT4

PART E: Answer Any 1 Following Questions. 10 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
12	Compare PoW, PoS, DPoS, and PBFT in terms of energy efficiency, scalability, fault tolerance, and typical applications.	10	CO2	BT4
13	Examine the Stellar Consensus Protocol (SCP) and Federated Byzantine Agreement (FBA) & Discuss their advantages in decentralized systems.	10	CO2	BT4