Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

Mid - Term Examinations – October 2025

Date: 08-10-2025 **Time:** 11.45am to 01.15pm

School: SOCSE	**Program:** B. Tech Computer Science and Engineering (CBC)	
Course Code : CBC2509	**Course Name:** Consensus Algorithm and Network Design.	
Semester: V	**Max Marks:**50	**Weightage:** 25%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks					

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **5Q x 2M=10M**

1	What is the role of consensus in decentralized systems?	**2 Marks**	**L2**	**CO1**
2	Give one example of a hybrid consensus model.	**2 Marks**	**L1**	**CO2**
3	What does ***liveness*** mean in a consensus algorithm?	**2 Marks**	**L1**	**CO1**
4	Differentiate between permissioned and permissionless blockchain networks.	**2 Marks**	**L2**	**CO1**
5	What does Delegated Proof-of-Stake (DPoS) introduce compared to PoS?	**2 Marks**	**L2**	**CO2**

Answer the Questions. **Total Marks 40M**

6.	**a.**	**Explain the role of consensus in decentralized blockchain systems with suitable examples.**	**10 Marks**	**L2**	**CO 1**
		Or			
7.	**a.**	Describe the requirements of a consensus protocol: safety, liveness, and fault tolerance.	**10 Marks**	**L2**	**CO 1**

8.	**a.**	**Compare Delegated Proof-of-Stake (DPoS) and Federated Consensus (Stellar Consensus Protocol).**	**10 Marks**	**L4**	**CO 2**
		Or			
9.	**a.**	Explain Practical Byzantine Fault Tolerance (PBFT) and analyze how it achieves consensus in the presence of faulty nodes.	**10 Marks**	**L4**	**CO 2**

10.	**a.**	**Compare and contrast permissioned and permissionless blockchain networks. Provide real-world examples.**	**10 Marks**	**L4**	**CO 1**
		Or			
11.	**a.**	Illustrate with examples how safety and liveness can come into conflict in consensus design.	**10 Marks**	**L4**	**CO 1**

12.	**a.**	**Write notes on hybrid consensus models and discuss scenarios where they are most useful.**	**10 Marks**	**L3**	**CO 2**
		Or			
13.	**a.**	Discuss Proof-of-Stake (PoS) and explain how Ethereum 2.0 implements it.	**10 Marks**	**L2**	**CO 2**