PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – MAY 2025

Date: 20-05-2025   **Time:** 09:30 am – 12:30 pm

School: SOIS	**Program**: BCA
Course Code: CSA3006	**Course Name:** Blockchain Technology
Semester: VI	**Max Marks:** 100 **Weightage:** 50%

CO - Levels	CO1	CO2	CO3	CO4	CO5
Marks	26	26	24	24	-

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.   **10Q x 2M=20M**

1.	Why Proof of Stake (PoS) is more efficient than Proof of Work (PoW).	**2 Marks**	**L2**	**CO1**
2.	Define cryptographic hash functions.	**2 Marks**	**L1**	**CO1**
3.	Define decentralization in blockchain with its significance to blockchain.	**2 Marks**	**L1**	**CO1**
4.	Summarize the purpose of nonce in Bitcoin mining.	**2 Marks**	**L2**	**CO2**
5.	What is the Bitcoin mining difficulty?	**2 Marks**	**L1**	**CO2**
6.	What is a mining pool?	**2 Marks**	**L1**	**CO2**
7.	List an example of a blockchain platform that provides anonymity and one that provides pseudo-anonymity.	**2 Marks**	**L1**	**CO3**
8.	What does zk-SNARK stand for, and what is its role in Zcash?	**2 Marks**	**L1**	**CO3**
9.	Define permissioned blockchain with an example from the financial industry.	**2 Marks**	**L1**	**CO4**
10.	Outline any two risks or challenges of implementing blockchain in supply chains.	**2 Marks**	**L2**	**CO4**

Part B

Answer the Questions.   **Total Marks 80M**

11.	a.	Outline the main components of blockchain architecture, including nodes, blocks, transactions, and ledgers. Also, explain the functioning of a peer-to-peer network in blockchain.	10M	L2	CO1
	b.	Explain the consensus mechanisms and explain Proof of Authority (PoA) and Proof of Stake (PoS) in detail. Additionally, discuss the various types of incentives used in blockchain networks.	10M	L2	CO1
		Or			
12.	a.	Illustrate the working of blockchain and how it ensures immutability and security in data storage. Additionally, discuss the major challenges associated with blockchain adoption.	10M	L2	CO1
	b.	Explain the key differences between PoW, PoA, and PoET in terms of consensus efficiency. How does PoC help businesses decide whether to implement blockchain technology?	10M	L2	CO1

13.	a.	Summarize the bitcoin script and its functions. Include applications of simple Bitcoin scripts to demonstrate its use.	10M	L2	CO2
	b.	Interpret the practical applications of Bitcoin scripts in implementing advanced transaction types such as time-lock and multi-signature transactions.	10M	L2	CO2
		Or			
14.	a.	Explain the major scalability issues in Bitcoin and explain how solutions like the Lightning Network help in addressing them.	10 M	L2	CO2
	b.	How do Bitcoin differ from Ethereum smart contracts? Explain with use cases.	10M	L1	CO2

15.	a.	How can pseudo-anonymity be compromised in public blockchains? Suggest mechanisms to improve privacy.	10M	L1	CO3
	b.	Explain the role of zk-SNARKs in achieving transaction privacy in Zcash. Provide a technical overview.	10M	L2	CO3
		Or			
16.	a.	Explain the Sybil and eclipse attacks. How do they target peer-to-peer networks in blockchain?	10M	L2	CO3
	b.	Analyse the process of deploying a smart contract on Ethereum. Include the compilation and deployment phases.	10M	L2	CO3

17.	a.	Analyze a real-world example of blockchain implementation in a supply chain (e.g., Walmart or IBM Food Trust).	10M	L2	CO4
	b.	Analyze how blockchain's impact on auto insurance, servicing, and parts authenticity using a case study.	10M	L4	CO4
		Or			
18.	a.	Examine a real-world blockchain application in the healthcare industry. Describe the problem it addresses, the implemented solution, and the resulting impact, using a case study.	10M	L4	CO4
	b.	Illustrate a blockchain application in the manufacturing industry. Explain the problem, solution, and impact.	10M	L2	CO4