Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 130002

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2025
Seventh Semester
Computer Science and Technology
U19CT717 – BLOCKCHAIN METHODOLOGY
(Regulation 2019)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	State the Zero Knowledge Proof.	2	K1	CO1
2.	Why does the Two Generals Problem demonstrate the difficulty of achieving consensus over an unreliable communication channel?	2	K2	CO1
3.	How does Bitcoin achieve immutability?	2	K2	CO2
4.	List the fundamental properties of Blockchain.	2	K1	CO2
5.	Differentiate between soft fork and hard fork.	2	K2	CO3
6.	Define the term: Distributed Database.	2	K1	CO3
7.	Why is Sybil attack a threat to the network?	2	K2	CO4
8.	How does Nakamoto Consensus secure a blockchain network?	2	K2	CO4
9.	How does double spend attack affect the integrity of a transaction?	2	K2	CO5
10.	List five popular cryptocurrencies.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	Explain the following security requirements of cryptographic hash functions. i. Pre-image resistant. ii. Second pre-image resistant. iii. Collision resistant.	13	K2	CO1
		(OR)			
	b)	Explain the Elliptic Curve Digital Signature Algorithm (ECDSA). Describe the roles of the public key, private key, and digital signature within the algorithm.	13	K2	CO1
12.	a)	Explain the various applications of blockchain technology across different industries. Discuss how blockchain enhances security, transparency, and efficiency in these applications, providing relevant examples.	13	K2	CO2
		(OR)			
	b)	Discuss the concepts of immutability, decentralization, and anonymity in the Bitcoin blockchain. Why are these properties important for the security and trustworthiness of the network?	13	K2	CO2
13.	a)	Illustrate with examples the Merkle Tree and Merkle Patricia Tree. Compare and contrast their structure and usage in blockchain systems.	13	K3	CO3
		(OR)			
	b)	Explain the block validation algorithm of Ethereum.	13	K2	CO3
14.	a)	Discuss the process of Bitcoin mining in detail.	13	K2	CO4
		(OR)			
	b)	Critically analyze the pros and cons of Proof of Work, Proof of Stake, and Proof of Burn as consensus mechanisms in blockchain technology.	13	K3	CO4
15.	a)	Explain the types of accounts used by Ethereum. Provide a rationale for the different types of accounts in Ethereum.	13	K3	CO5
		(OR)			
	b)	Describe the various applications of Bitcoin scripting language and how it enhances Bitcoin's functionality.	13	K3	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	Design a mechanism for managing the agricultural supply chain using a private blockchain. Similarly, design a mechanism using a public blockchain. Compare and evaluate both mechanisms, listing their respective advantages and disadvantages.	15	K3	CO5
		(OR)			
	b)	Create a high-level design outline of a smart contract for a land registration system. Justify your design choices. Compare and contrast this smart contract-based system with the traditional land registration process.	15	K3	CO5