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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VI - THEORY EXAMINATION (2025 - 2026)

Subject: Blockchain and Cryptocurrency Security

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of **three Sections -A, B, & C**. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A

20

1. Attempt all parts:-

- (1.1) A group of banks collaborates to maintain a shared blockchain network where each organization participates in validation and governance. (CO1,K1) 1
- (a) Public blockchain
- (b) Private blockchain
- (c) Consortium blockchain
- (d) Standalone blockchain
- (1.2) A blockchain system records transactions in such a way that earlier records cannot be changed and all entries follow a strict sequence. Recognize the blockchain structure that ensures chronological transaction order. (CO1,K1) 1
- (a) Data table
- (b) Node registry
- (c) Block chain linkage
- (d) File server
- (1.3) Match blockchain component with function storing transaction history. (CO2,K1) 1
- (a) Node
- (b) Block
- (c) Wallet
- (d) Token
- (1.4) Differentiate among the types of blockchains and identify the one that is managed by multiple organizations. (CO2,K1) 1
- (a) Public blockchain
- (b) Private blockchain

- (c) Consortium blockchain
- (d) Standalone blockchain
- (1.5) Identify the blockchain type allowing open participation. (CO3,K1) 1
 - (a) Private blockchain
 - (b) Consortium blockchain
 - (c) Public blockchain
 - (d) Hybrid blockchain
- (1.6) Recall the system maintaining copy of blockchain ledger. (CO3,K1) 1
 - (a) Wallet
 - (b) Miner
 - (c) Server
 - (d) Node
- (1.7) Identify the blockchain component that stores the hash of the previous block. (CO4,K1) 1
 - (a) Token
 - (b) Node
 - (c) Wallet
 - (d) Block header
- (1.8) Examine the following blockchain types and select the one that involves shared governance among several organizations. (CO4,K1) 1
 - (a) End-to-end audit trail
 - (b) Data compression
 - (c) Record deletion
 - (d) Access restriction
- (1.9) Recall the blockchain feature that enables transparency across all participants. (CO5,K1) 1
 - (a) Encryption secrecy
 - (b) Hidden nodes
 - (c) Shared ledger visibility
 - (d) Closed network
- (1.10) Identify the primary cybersecurity benefit of applying blockchain technology to data protection systems. (CO5,K1) 1
 - (a) Continuous distributed tamper-evident records
 - (b) Periodic backup
 - (c) Central storage
 - (d) Offline replication

2. Attempt all parts:-

- (2.1) Compare distributed ledger and centralized database based on control and data storage. (CO1,K2) 2
- (2.2) Identify algorithm commonly used in blockchain hashing. (CO2,K2) 2
- (2.3) Distinguish between a coin and a token based on usage and platform 2

	dependency. (CO3,K2)	
(2.4)	Recognize attack based on fake identities. (CO4,K2)	2
(2.5)	Distinguish Layer 1 and Layer 2 blockchain solutions. (CO5,K2)	2
SECTION-B		30
Answer any <u>one</u> of the following:-		
(3.1)	Illustrate blockchain use in supply chain management. (CO1,K3)	6
(3.2)	Analyze benefits of blockchain transparency and traceability in transaction systems. (CO1,K3)	6
Answer any one of the following:-		
(3.3)	Illustrate the role of asymmetric cryptography in blockchain. (CO2,K3)	6
(3.4)	Differentiate hot wallet and cold wallet. (CO2,K3)	6
Answer any one of the following:-		
(3.5)	Demonstrate the complete transaction lifecycle in blockchain from creation to final confirmation with key stages. (CO3,K3)	6
(3.6)	Describe the role of mining in blockchain security, including its contribution to integrity and double-spending prevention. (CO3,K3)	6
Answer any one of the following:-		
(3.7)	Illustrate the reentrancy attack using call stack behavior. (CO4,K3)	6
(3.8)	Demonstrate the denial of service caused by gas limit exhaustion. (CO4,K3)	6
Answer any one of the following:-		
(3.9)	Evaluate blockchain-based cybersecurity systems by comparing them with traditional centralized security models in terms of resilience and trust. (CO5,K3)	6
(3.10)	Assess Zero-Knowledge Proof techniques for balancing transparency and confidentiality in blockchain systems. (CO5,K3)	6
SECTION-C		50
4. Answer any <u>one</u> of the following:-		
(4.1)	Illustrate the structure and components of a blockchain system including blocks, nodes, and network. (CO1,K3)	10
(4.2)	Investigate the role of blockchain in improving digital trust networks. (CO1,K3)	10
5. Answer any <u>one</u> of the following:-		
(5.1)	Investigate the resistance of Proof-of-Work against large-scale computational attacks. (CO2,K4)	10
(5.2)	Use public key cryptography to secure a transaction and interpret the confidentiality mechanism. (CO2,K4)	10
6. Answer any <u>one</u> of the following:-		
(6.1)	Illustrate Ethereum's transition from Proof-of-Work to Proof-of-Stake and its impact on performance and ecosystem. (CO3,K4)	10
(6.2)	Evaluate the role of tokens, ICOs, and airdrops in strengthening or challenging blockchain ecosystems. (CO3,K4)	10
7. Answer any <u>one</u> of the following:-		
(7.1)	Demonstrate the 51% attack in blockchain systems. Exemplify (CO4,K3)	10

- (7.2) Illustrate Sybil attack in blockchain networks with a suitable example. (CO4,K3) 10
8. Answer any one of the following:-
- (8.1) Evaluate blockchain adoption in cybersecurity infrastructures focusing on intrusion detection, logging, and threat intelligence sharing. (CO5,K4) 10
- (8.2) Assess decentralized identity verification using blockchain in terms of privacy preservation and usability. (CO5,K4) 10

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