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

M.Tech

SEM: II - THEORY EXAMINATION (2025 - 2026)

Subject: Introduction to Blockchain

Time: 3 Hours

Max. Marks: 70

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

15

1. Attempt all parts:-

- (1.1) Decentralized blockchains are _____(CO1,K2) 1
- (a) Immutable
- (b) REGULAR
- (c) IRREGULAR
- (d) LEDGER
- (1.2) If a participant node tampers with a block, it results in _____. (CO2,K2) 1
- (a) hash changing
- (b) mismatch of hash values
- (c) the local chain of node rendered in an invalid state
- (d) All of the above
- (1.3) Which consensus mechanism is more scalable with respect to throughput of transactions nodes(CO3,K3) 1
- (a) PBFT
- (b) PoW
- (c) POA
- (d) PBFT and POW
- (1.4) Which Block chain is made for cross border payment settlements.(CO4,K3) 1
- (a) Ethereum
- (b) Bitcoin
- (c) Ripple
- (d) Hyperledger

- (1.5) In which programming language is Smart Contracts written?(CO5,K2) 1
- (a) kotlin
 - (b) tcl/tk
 - (c) solidity
 - (d) N/A

2. Attempt all parts:-

- (2.1) Explain the different Crypto Primitives.(CO1,K2) 2
- (2.2) Discuss the properties of hash functions.(CO2,K2) 2
- (2.3) Explain the pre-prepare stage of PBFT in detail.(CO3,K2) 2
- (2.4) Define Hybrid block Chain for enterprise.(CO4,K3) 2
- (2.5) Describe in detail the components of Ethereum. (CO5,K3) 2

SECTION-B

20

Answer any one of the following:-

- (3.1) Explain the term significance of cryptocurrency in block chain.(CO1,K2) 4
- (3.2) Define the Merkle Tree in details.(CO1,K3) 4

Answer any one of the following:-

- (3.3) Differentiate between Public and Private Key Cryptography.(CO2,K2) 4
- (3.4) Deduce the usage of Zero Knowledge systems .(CO2,K3) 4

Answer any one of the following:-

- (3.5) Differentiate between PoW and PoS with an example.(CO3,K2) 4
- (3.6) Define the role of the Miner in Block Chain.(CO3,K3) 4

Answer any one of the following:-

- (3.7) Why are businesses adopting blockchain technology?.(CO4,K2) 4
- (3.8) How does enterprise blockchain enhance transparency and security?(CO4,K2) 4

Answer any one of the following:-

- (3.9) How Ethereum differs from Ripple?(CO5,K3) 4
- (3.10) Create a blockchain based smart contract for crowd funding application. (CO5,K3) 4

SECTION-C

35

4. Answer any one of the following:-

- (4.1) How is a block recognized within the Blockchain approach?(CO1,K3) 7
- (4.2) Write the steps of RSA algorithm.(CO1,K2) 7

5. Answer any one of the following:-

- (5.1) Analyze the characteristics of cryptographically secured hash function and their use in blockchain.(CO2,K2) 7
- (5.2) Define collision resistance in hash functions. Why is it important for security.(CO2,K2) 7

6. Answer any one of the following:-

- (6.1) Describe the application of the block chain in electronic health records.(CO3,K3) 7

- (6.2) Explain the architecture and working of a permissioned blockchain network.(CO3,K4) 7
7. Answer any one of the following:-
- (7.1) Give examples of public and private blockchain platforms in details.(CO4,K2) 7
- (7.2) How does blockchain improve supply chain management?(CO4,K3) 7
8. Answer any one of the following:-
- (8.1) Explain mining principle behind bitcoin and ethereum.(CO5,K2) 7
- (8.2) Name two languages used for writing the Smart Contracts and define Turing Completeness.(CO5,K3) 7

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