

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

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 Technology and Application Development

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) | Where can you buy cryptocurrency?(CO1,K2) | 1 |
| (a) | A private An exchange | |
| (b) | An exchange | |
| (c) | All of the above | |
| (d) | A Bitcoin ATM | |
| (1.2) | The purpose of a nonce is(CO1,K2) | 1 |
| (a) | A hash function | |
| (b) | Prevents double spending | |
| (c) | Sends information to the blockchain network | |
| (d) | Follows nouns | |
| (1.3) | Which is/are the applications of Blockchain?(CO2,K2) | 1 |
| (a) | Cross-border payments | |
| (b) | Anti-money laundering tracking system | |
| (c) | Supply chain and logistics monitoring | |
| (d) | All the above | |
| (1.4) | Bitcoin is a solution to the double-spend problem?(CO2,K2) | 1 |
| (a) | TRUE | |
| (b) | False | |
| (c) | Sometimes | |
| (d) | None of the above | |
| (1.5) | Smart contract in the context of Ethereum application development(CO3,K2) | 1 |

- (a) A legal document
 - (b) A self-executing code that automatically executes the terms of an agreement
 - (c) A database
 - (d) A user interface
- (1.6) The role of the Ethereum Virtual Machine (EVM) in application development(CO3,K3) 1
- (a) It compiles and executes smart contracts
 - (b) It provides a development environment for DApps
 - (c) It provides an interface for developers to interact with the Ethereum blockchain
 - (d) It stores data for DApps
- (1.7) Decentralized application (DApp) is(CO4,K2) 1
- (a) An application that runs on a centralized server
 - (b) An application that runs on a blockchain
 - (c) An application that runs on a distributed network
 - (d) An application that runs on a mobile device
- (1.8) Blockchain fork is(CO4,K3) 1
- (a) A change in the protocol of the blockchain
 - (b) A split in the blockchain that creates two separate chains
 - (c) A merger of two different blockchains
 - (d) None of the above
- (1.9) Which of the following programming languages is not supported by Hyperledger Fabric for smart contract development?(CO5,K2) 1
- (a) Go
 - (b) JavaScript
 - (c) Python
 - (d) Solidity
- (1.10) HLF Chaincode can be written in(CO5,K2) 1
- (a) node JS
 - (b) java
 - (c) go lang
 - (d) All of thee

2. Attempt all parts:-

- (2.1) Explain the term block in a block chain.(CO1,K1) 2
- (2.2) Define Distributed consensus.(CO2,K2) 2
- (2.3) Differentiate between hybrid and consortium block chain.(CO3,K2) 2
- (2.4) Explain Ether and how is it used in Ethereum?(CO4,K2) 2
- (2.5) How does Hyperledger Fabric ensure security and privacy for enterprise applications?(CO5,K2) 2

SECTION-B

30

Answer any one of the following:-

- (3.1) Explain the various components of the block chain architecture.(CO1,K1) 6
- (3.2) Describe the role of cryptographic hash functions and the role of the Merkle tree in blockchain.(CO1,K2) 6

Answer any one of the following:-

- (3.3) How the double spending problem can be prevented in the block chain network. (CO2,K2) 6
- (3.4) Describe the block chain in reference to transaction bitcoin network.(CO2,K2) 6

Answer any one of the following:-

- (3.5) Define mining pool in Ethereum?(CO3,K2) 6
- (3.6) Explain the the role of miners in the Ethereum network.(CO3,K3) 6

Answer any one of the following:-

- (3.7) Define a nonce in Ethereum mining.(CO4,K2) 6
- (3.8) Define a the importance of remix.ethereum.org.(CO4,K2) 6

Answer any one of the following:-

- (3.9) Defien the significane of the hyperledger.(CO5,K1) 6
- (3.10) If the life cycle of chaincode in Hyperledger Fabric consists of 5 stages, and each stage takes an average of 2 days to complete, how long does the entire life cycle process take from start to finish?Define chain code life cycle.(CO5,K3) 6

SECTION-C 50

4. Answer any one of the following:-

- (4.1) How do verifiers check whether the block is valid? Explain the whole process of it.(CO1,K3) 10
- (4.2) Give the difference between NFT and fungible token.(CO1,K2) 10

5. Answer any one of the following:-

- (5.1) How thE transaction cost is computed in Ethereum minng?(CO2,K2) 10
- (5.2) How th systems got affected by the attacks on the PoW network?(CO2,K3) 10

6. Answer any one of the following:-

- (6.1) How do developers ensure the security and privacy of user data in decentralized applications built on the Ethereum blockchain, and what are the best practices for mitigating potential vulnerabilities and attacks?(CO3,K2) 10
- (6.2) Define the difference between private and public blockchains, and what are the use cases for each in decentralized application development on the Ethereum blockchain?(C03,K2) 10

7. Answer any one of the following:-

- (7.1) How do developers use tokenization and digital assets in decentralized applications built on the Ethereum blockchain, and what are the benefits and risks of these approaches?(CO4,K2) 10
- (7.2) Define the role of consensus mechanisms in the Ethereum blockchain, and how do they ensure the integrity and security of the network?(CO4,K3) 10

8. Answer any one of the following:-

- (8.1) Evaluate the suitability of Hyperledger Fabric 1.x and Hyperledger Fabric 2.x for 10

different use cases.(CO5,K3)

- (8.2) Critically analyze the challenges faced in deploying chaincode in Hyperledger networks.(CO5,K2)

10

REG_JAN_JUNE_2026