Printed Page:- **Subject Code**:- **ACSAI0601**

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: VI - THEORY EXAMINATION (20.....- 20.....)

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-a. Which is NOT a part of asymmetric encryption?(CO1,K1) 1

(a) Mining
(b) Public key
(c) Passphrase
(d) Private Key

1-b. Genesis block is (CO1,K2) 1

(a) The first block of a Blockchain
(b) A famous block that hardcoded a hash of the Book of Genesis onto the blockchain
(c) The first block after each block halving
(d) The 2nd transaction of a Blockchain

1-c. BATM stands for _____. (CO2,K2) 1

(a) Bounded access transaction machine
(b) Broadcast ATM
(c) Bitcoin ATM
(d) Blockchain ATM

1-d. Smart Contract characteristics do not include: (CO2,K2) 1

(a) A high degree of accuracy
(b) Fast and cost-effective
(c) Alterable

(d) Transparency

1-e. The native cryptocurrency of the Ethereum network called (CO3,K1) 1

(a) Bitcoin
(b) Litecoin
(c) Ether
(d) Dogecoin

1-f. Consensus algorithm are (CO3,K2) 1

(a) Delegated Proof of Stake (DPoS)
(b) Proof of Burn
(c) Proof of Stake (PoS)
(d) All of these

1-g. The main benefit of using blockchain in supply chain management (CO4,K2) 1

(a) Increased transparency
(b) Decreased costs
(c) Increased efficiency
(d) All of the above

1-h. The purpose of a digital identity in enterprise blockchain (CO4,K1) 1

(a) To ensure data privacy and security
(b) To identify and authenticate participants on the blockchain
(c) To execute smart contracts
(d) None of the above

1-i. The main advantage of a permissioned blockchain platform over a permissionless one (CO5,K1) 1

(a) Higher security
(b) Faster transactions
(c) Decentralization
(d) Public accessibility

1-j. Which of the following is not a programming language used for smart contract development in Hyperledger Fabric (CO5,K2) 1

(a) Solidity
(b) Java
(c) Go
(d) C

2. Attempt all parts:-

2.a. Name the different types of the block chain. (CO1,K2) 2

2.b. Explain block relay. (CO2 ,K2) 2

2.c. Define Pragma directive. (CO3,K2) 2

2.d. How do decentralized applications work on the Ethereum network? (CO4,K1) 2

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2.e.	How does Hyperledger Fabric ensure security and privacy for enterprise applications?(CO5 ,K2)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Define the role of the cryptography ,hash functions in terms of the block chain network and justify it with an example.(CO1,K2)	6
3-b.	Explain the Properties of the Hash Functions. (CO1,K2)	6
3-c.	Differentiate between Block and Uncle reward .(CO2,K3)	6
3-d.	Compare and Contrast the Proof of Work and Proof of Stake.(CO2,K2)	6
3.e.	Define smart contract and its role in the block chain network.(CO3,K2)	6
3.f.	Describe the smart contract security and vulnerability. (CO4,K2)	6
3.g.	Differentiate between Hyperledger FAbric 1.x and 2.x . (CO5,K1)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Explain the features of public blockchain in details with an example.(CO1,K2)	10
4-b.	Explain the usage of blockchain technology in the government sector and how it can improve the security features of a particular sector.(CO1,K2)	10

5. Answer any one of the following:-

5-a.	Explain the 51 % attack in details.Define block mining and transaction cost.(CO2,K2)	10
5-b.	Expalin pBFT,bitcoin mining and mining difficulty .If the gas limit for a block in Ethereum is 15,000,000 gas, and the average gas price is 20 Gwei, how much ETH will be spent to complete a transaction using the full block capacity? (CO2,K3)	10

6. Answer any one of the following:-

6-a.	How can digital currency improve financial inclusion in rural and underserved areas of India?(CO3,K3)	10
6-b.	Explain most promising use cases for blockchain and decentralized applications in industries such as finance, healthcare, and supply chain management?(CO3,K3)	10

7. Answer any one of the following:-

7-a.	How do developers build and deploy decentralized finance (DeFi) applications on the Ethereum blockchain, and what are the key features and benefits of these applications?(CO4,K3)	10
7-b.	Compare and contrast soft fork and hard fork in terms of consensus, backward compatibility, and impact on the blockchain.(CO4,K3)	10

8. Answer any one of the following:-

8-a.	How does Hyperledger Fabric ensure privacy and confidentiality in enterprise blockchain solutions? Difference between Orderer and Peer Node.(CO5,K3)	10
8-b.	How would you design a system using Corda to ensure transaction integrity	10

without revealing data to the whole network? Differentiate between Solo and Kafka.(CO5,K3)

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