Printed Page:- 04 **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 (2023 - 2024)

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. Miner is (CO1) 1

(a) A type of blockchain

(b) An algorithm that predicts the next part of the chain

(c) A person doing calculations to verify a transaction

(d) Computers that validate and process blockchain transactions

1-b. The term for when a blockchain splits (CO1) 1

(a) A merger

(b) A fork

(c) A division

(d) None of these

1-c. Bitcoin is based on _____ blockchain.(CO2) 1

(a) Private

(b) Public

(c) Public Permissioned

(d) Permissioned

1-d. Which of the followings are not the components of the block chain?(CO2) 1

(a) Smart contracts

(b) Wallet

(c) Certificate Authority

(d) Ledger

1-e. The purpose of Ether is (CO3) 1

(a) To be used as a currency

(b) To be used as a fuel for the Ethereum network

(c) To be used as a store of value

(d) None of the above

1-f. The role of a node in the Ethereum network (CO3) 1

(a) To validate transactions and add them to the blockchain

(b) To mine new blocks on the blockchain

(c) To store data on the blockchain

(d) None of the above

1-i. The role of a peer node in the Hyperledger Fabric network? (CO5) 1

(a) Verify and validate transactions

(b) Order transactions

(c) Execute smart contracts

(d) Manage access control

1-g. The role of a node in the Ethereum network (CO4) 1

(a) To validate transactions and add them to the blockchain

(b) To mine new blocks on the blockchain

(c) To store data on the blockchain

(d) None of the above

1-j. A key characteristic of the Hyperledger network (CO5) 1

(a) It is a public blockchain network and one of the oldest networks, existing since 2009

(b) It is private, open sourced and can run everyone's own distributed ledger technology (DLT).

(c) It utilizes cryptocurrency as a reward mechanism, which makes the network more secure

(d) It utilizes the Proof of Stake (PoS) consensus algorithm as its main security measure.

1-h. The programming language used for developing Ethereum applications (CO4) 1

(a) Python

(b) Solidity

(c) JavaScript

(d) Ruby

2. Attempt all parts:-

2.a. Explain the inherent disadvantages of the distributed system. (CO1) 2

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

2.c. How do smart contracts work in Ethereum? (CO3) 2

2.e.	How does Hyperledger Fabric ensure security and privacy for enterprise applications?(CO5)	2
2.d.	How does Ethereum differ from Bitcoin? (CO4)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Explain the limitations of the block chain technology. (CO1)	6
3-b.	Difference between different types of Blockchain.(CO1)	6
3-c.	Describe the block chain in reference to transaction bitcoin network.(CO2)	6
3-d.	Define the concept of the Proof of Burn.(CO2)	6
3.e.	How does Ethereum plan to transition from Proof of Work to Proof of Stake?(CO3)	6
3.g.	Explain the steps of deploying the chain code.(CO5)	6
3.f.	How are blocks created and validated in Ethereum?(CO4)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Explain the Block diagram of the block chain in details.(CO1)	10
4-b.	If each block in a blockchain has a maximum size of 1 MB, and new blocks are added every 10 minutes on average, how many blocks are added to the blockchain in one day?How does a permissioned blockchain address the scalability and privacy concerns associated with public blockchains?(CO1)	10

5. Answer any one of the following:-

5-a.	Elobrate the Ethereum network in details.(CO2)	10
5-b.	PoW and PoS are two mechainism used in a block chain framework which one is better? Justify this statement.(CO2)	10

6. Answer any one of the following:-

6-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?(CO3)	10
6-b.	How do developers address scalability and performance issues in decentralized applications built on the Ethereum blockchain, and what are the latest approaches and solutions for these challenges?(CO3)	10

7. Answer any one of the following:-

7-a.	Define the challenges and limitations of developing applications on the Ethereum blockchain, and how do developers address these challenges to ensure the success of their projects?(CO4)	10
7-b.	Define the role of mining in the Ethereum blockchain, and how do developers interact with miners to ensure the smooth operation of their decentralized applications?(CO4)	10

8. Answer any one of the following:-

8-a.	Critically analyze the challenges faced in deploying chaincode in Hyperledger networks.(CO5)	10
8-b.	How can Hyperledger be used for digital asset management and tokenization?(CO5)	10