

(3Hours)

[Total Marks: 75]

- N. B.: (1) All questions are compulsory.
(2) Make suitable assumptions wherever necessary and state the assumptions made.
(3) Answers to the same question must be written together.
(4) Numbers to the right indicate marks.
(5) Draw neat labelled diagrams wherever necessary.
(6) Use of Non-programmable calculators is allowed.

Q1. Attempt the three of the following.

15 Marks

- What is the Proof of Stake (PoS) consensus mechanism in blockchain, and how does it differ from Proof of Work?
- What is the Ethereum Virtual Machine (EVM), and what role does it play in executing smart contracts on the Ethereum network?
- What are the various applications of smart contracts, and how are they utilized in different industries?
- What is a blockchain fork, and what are the different types of forks that can occur in a blockchain network?

Q2. Attempt the three of the following.

15 Marks

- What are the key layers of blockchain, and why is blockchain considered important across industries?
- Explain expression and statements in solidity.
- How does Proof of Work help regulate block time in Ethereum, and what roles do DAG, nonce, and faster blocks play in mining?
- What is cryptoeconomics, and how does it relate to the speed of blocks, Ether issuance, and common attack scenarios in the blockchain ecosystem?
- How does the Ethereum Virtual Machine (EVM) function as the backend for smart contracts, and how are assets backed by various entities?

Q3. Attempt three of the following.

15 marks

- How do cryptography, game theory, and computer science engineering contribute to the foundation and functioning of blockchain?
- What is Complementary Currency?
- Explain the working of smart contracts.
- Explain Cryptoeconomics.
- How do public and private blockchains differ in terms of their use cases

Q4. Attempt three of the following.

15 marks

- Explain Merkle tree in blockchain.
- What are tokens in the context of smart contracts, and how can you create, deploy, and interact with a token within a blockchain network?
- What are the benefits of Hyperledger Fabric
- Explain how speed of blocks play an important role in mining
- Explain steps for Setting up a Private Ethereum Network.

Q5. Attempt three of the following.

15 marks

- How does the Bitcoin blockchain operate, and what role do full nodes, SPVs, and wallets play in its network?
- Explain Wallet in blockchain.
- Explain working of Hyperledger Fabric with a suitable diagram
- Differentiate between Faster Blocks and Stale Blocks.
- What are decentralized applications?
