

(2½ Hours)

[Total Marks: 60]

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 labeled diagrams wherever necessary.

(6) Use of Non-programmable calculators is allowed.

**Q1. Attempt the two of the following.**

**12 Marks**

- How do smart contracts function, and what is their significance?
- What is a Merkle tree, and how is it utilized in blockchain technology?
- What is a private blockchain, and how does it operate?
- Explain the Ethereum blockchain and its features.

**Q2. Attempt the two of the following.**

**12 marks**

- What is a blockchain fork, and why does it occur?
- What are complementary currencies, and how do they function?
- What are the advantages and disadvantages of smart contracts?
- How does block speed impact the mining process in blockchain?

**Q3. Attempt the two of the following.**

**12 marks**

- What are wallets in blockchain, and what are the different types of wallets?
- What are faster blocks and stale blocks in blockchain, and how do they differ?
- What are the advantages of Hyperledger Fabric?
- How is cryptoeconomics defined, and what is its significance?

**Q4. Attempt the two of the following.**

**12marks**

- How are expressions and statements written in Solidity?
- What is a transaction in blockchain, and how does it work?
- What are the concepts of centralization and decentralization, and how do they differ?
- What is the Ethereum Virtual Machine, and what role does it play in blockchain?

**Q5. Attempt the two of the following.**

**12 marks**

- Explain Proof of Stake consensus mechanism in blockchain.
- What are the properties of blockchain?
- Discuss Smart Contract in blockchain also write sample smart contract.
- List and explain the Applications of smart contracts.

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