

(3 Hours)

(Total Marks: 80)

- N.B.:**
1. Question No. 1 is compulsory.
 2. Answer any three out of the remaining questions.
 3. Assume suitable data if necessary.
 4. Figures to the right indicate full marks.



Q1. Attempt the following (any 4):

(20)

- a. Distinguish between public, private, and consortium blockchain.
- b. Explain the concept of double spending with a suitable example.
- c. Compare hot wallets and cold wallets.
- d. What is a Merkle tree? Explain the structure of a Merkle tree.
- e. Write a program in solidity to find the second largest element in an array.

Q2. Attempt the following:

- a. With a suitable diagram, explain the structure of a block header with a list of transactions. (10)
- b. State and explain different types of cryptocurrencies. (10)

Q3. Attempt the following:

- a. Describe the concept of state machine replication. How is a smart contract represented as a state machine? (10)
- b. Explain Hyperledger Fabric v1 architecture. (10)

Q4. Attempt the following:

- a. Describe the architecture on Ethereum. (10)
- b. Write a program in solidity to implement single inheritance. (10)

Q5. Attempt the following:

- a. Explain RAFT consensus mechanism for a private blockchain. (10)
- b. Explain fixed and dynamic arrays in solidity with suitable examples. (10)

Q6. Write short notes on (any 2):

(20)

- a. Ripple
- b. UTXO model of Bitcoin
- c. Corda
- d. Blockchain for DeFi