

(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)
- Define blockchain? Compare different types of blockchain.
  - What is a smart contract? How crowdfunding platforms can be managed using smart contracts?
  - What is a backup in Practical Byzantine Fault Tolerance (PBFT) algorithm?
  - What is a Merkle tree? Explain the structure of a Merkle tree.
  - Write a program in solidity to check whether a number is prime or not.
- Q2. Attempt the following:**
- State and explain various challenges that occur while implementing blockchain. (10)
  - What is a double spending problem? How PoW solves the problem of double spending? (10)
- Q3. Attempt the following:**
- Compare Bitcoin and Ethereum. How to calculate Mining difficulty in bitcoin (10)
  - Explain Hyperledger Fabric v1 architecture. (10)
- Q4. Attempt the following:**
- Describe the architecture of Ethereum. (10)
  - Write a program in solidity to implement multi-level inheritance. (10)
- Q5. Attempt the following:**
- Explain PAXOS consensus algorithm for a private blockchain. (10)
  - Explain fixed and dynamic arrays in solidity with suitable examples. (10)
- Q6. Write short notes on (any 2):** (20)
- Corda
  - UTXO model of Bitcoin
  - Quorum
  - Fallback function in Solidity

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