

# U23CSV46 Cryptocurrency and Blockchain Technologies

## Question bank

### UNIT I – INTRODUCTION TO BLOCKCHAIN

#### 2 Marks Questions with Answers

- 1. What is Blockchain?**  
Blockchain is a decentralized digital ledger used to record transactions securely and transparently.
- 2. What is a Public Ledger?**  
A public ledger is a record of transactions accessible to all participants in a blockchain network.
- 3. What is a Block?**  
A block is a container that stores transaction data, timestamp, and hash of the previous block.
- 4. What is Hashing?**  
Hashing is the process of converting input data into a fixed-length string using a hash function.
- 5. What is SHA-256?**  
SHA-256 is a cryptographic hash algorithm widely used in blockchain for security.
- 6. What is a Hash Pointer?**  
A hash pointer is a pointer that contains the address of previous block along with its hash value.
- 7. What is a Merkle Tree?**  
A Merkle tree is a binary hash tree used to efficiently verify data integrity in blockchain.
- 8. What is the Longest Chain Rule?**  
The longest chain rule states that the valid blockchain is the chain with the most accumulated work.
- 9. What is Permissioned Blockchain?**  
Permissioned blockchain restricts participation to authorized users.
- 10. What is Decentralization?**  
Decentralization means control is distributed among multiple nodes rather than a central authority.

#### 16 Marks Questions

1. Explain blockchain technology and public ledgers in detail.
2. Explain the structure of a block and blockchain architecture.
3. Describe hash functions and their properties in blockchain.
4. Explain Merkle tree and hash pointer with diagram.
5. Discuss permissioned and permissionless blockchain models.

## UNIT II – BITCOIN AND CRYPTOCURRENCY

### 2 Marks Questions with Answers

1. **What is Cryptocurrency?**  
Cryptocurrency is a digital currency secured using cryptography.
2. **What is Bitcoin?**  
Bitcoin is the first decentralized cryptocurrency created in 2009.
3. **Who created Bitcoin?**  
Bitcoin was created by an anonymous person or group named **Satoshi Nakamoto**.
4. **What is Bitcoin Script?**  
Bitcoin script is a simple programming language used for transaction validation.
5. **What is Double Spending?**  
Double spending occurs when the same digital currency is spent more than once.
6. **What is Bitcoin Mining?**  
Bitcoin mining is the process of validating transactions and adding new blocks to the blockchain.
7. **What is a Bitcoin Node?**  
A node is a computer that participates in the Bitcoin network.
8. **What is Block Propagation?**  
Block propagation is the process of distributing a newly mined block across the network.
9. **What is a Transaction in Bitcoin?**  
A transaction is the transfer of bitcoins between users.
10. **What is a P2P Network?**  
Peer-to-Peer network allows nodes to communicate directly without a central server.

### 16 Marks Questions

1. Explain the working of Bitcoin cryptocurrency.
2. Describe Bitcoin P2P network and Bitcoin transactions.
3. Explain Bitcoin mining and block propagation.
4. Discuss the problem of double spending and its solution.
5. Explain Bitcoin scripting language.

## UNIT III – BITCOIN CONSENSUS

### 2 Marks Questions with Answers

1. **What is Consensus?**  
Consensus is the agreement among network nodes on the validity of transactions.
2. **What is Proof of Work (PoW)?**  
PoW is a consensus mechanism where miners solve mathematical puzzles to add blocks.

3. **What is Hashcash?**  
Hashcash is a PoW algorithm used to prevent spam and used in Bitcoin mining.
4. **What is Mining Difficulty?**  
Mining difficulty determines how hard it is to find a valid block hash.
5. **What is a Mining Pool?**  
A mining pool is a group of miners combining computing power to mine blocks.
6. **What is Proof of Stake (PoS)?**  
PoS selects validators based on the amount of cryptocurrency they hold.
7. **What is Proof of Burn?**  
Proof of Burn requires miners to destroy coins to gain mining rights.
8. **What is Proof of Elapsed Time (PoET)?**  
PoET randomly assigns block creation rights using trusted execution environments.
9. **What is the Monopoly Problem in Mining?**  
It occurs when a single miner controls most of the mining power.
10. **What is a Bitcoin Miner?**  
A miner is a participant who validates transactions and creates new blocks.

### **16 Marks Questions**

1. Explain the Bitcoin consensus mechanism.
2. Describe Proof of Work and Hashcash algorithm.
3. Explain Proof of Stake, Proof of Burn and Proof of Elapsed Time.
4. Discuss mining difficulty and mining pools.
5. Explain attacks on Proof of Work systems.

## **UNIT IV – HYPERLEDGER FABRIC & ETHEREUM**

### **2 Marks Questions with Answers**

1. **What is Hyperledger Fabric?**  
Hyperledger Fabric is a permissioned blockchain framework for enterprise applications.
2. **What is Chaincode?**  
Chaincode is the smart contract used in Hyperledger Fabric.
3. **What is Ethereum?**  
Ethereum is a blockchain platform used to build decentralized applications.
4. **What is EVM?**  
Ethereum Virtual Machine executes smart contracts in the Ethereum network.
5. **What is Ether?**  
Ether is the cryptocurrency used in the Ethereum network.
6. **What is Gas in Ethereum?**  
Gas is the fee required to perform transactions or execute smart contracts.

7. **What is Mist Browser?**  
Mist is an Ethereum wallet and browser for decentralized applications.
8. **What is Solidity?**  
Solidity is a programming language used to write Ethereum smart contracts.
9. **What is a Transaction Fee?**  
Transaction fee is the amount paid to miners for processing transactions.
10. **What is a DApp?**  
A decentralized application runs on a blockchain network.

### 16 Marks Questions

1. Explain Hyperledger Fabric architecture.
2. Describe the Ethereum network and its components.
3. Explain Ethereum Virtual Machine and gas mechanism.
4. Discuss chaincode and smart contracts.
5. Explain Solidity programming and Ethereum transactions.

## UNIT V – BLOCKCHAIN APPLICATIONS

### 2 Marks Questions with Answers

1. **What is a Smart Contract?**  
A smart contract is a self-executing contract with predefined conditions.
2. **What is Truffle?**  
Truffle is a development framework for Ethereum smart contracts.
3. **What is NFT?**  
NFT (Non-Fungible Token) represents ownership of a unique digital asset.
4. **What are DApps?**  
DApps are decentralized applications running on blockchain networks.
5. **What is Supply Chain Management in Blockchain?**  
It uses blockchain to track goods from production to delivery.
6. **What is Blockchain in Banking?**  
Blockchain helps in secure and faster financial transactions.
7. **What is Blockchain in Insurance?**  
Blockchain automates claim processing using smart contracts.
8. **What is Smart City Blockchain Application?**  
Blockchain helps manage services like energy, transportation, and data securely.
9. **What is Blockchain in Logistics?**  
Blockchain improves transparency in shipment tracking.
10. **What is a Case Study in Blockchain?**  
A case study analyzes real-world blockchain implementations.

### **16 Marks Questions**

1. Explain smart contracts and decentralized applications.
2. Discuss NFTs and their applications.
3. Explain blockchain applications in supply chain management.
4. Discuss blockchain applications in banking and finance.
5. Explain blockchain applications in insurance, logistics and smart cities.