

# Sample Questions with Answers

## Blockchain

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Blockchain

**[NOTE] Important Note:** This PDF contains sample questions with complete answers and explanations. Visit [SolveMyQues.com](https://www.solvemyques.com) for our complete question bank, interactive tests, and detailed performance tracking!

### Question 1:

Explain blockchain technology with a simple example of how blocks are connected.

#### [ANSWER] Answer & Explanation:

Blockchain is a distributed digital ledger that stores data in blocks linked together using cryptographic hashes.

**Basic Structure:**

Block 1 (Genesis):  
- Data: "Alice sends 10 coins to Bob"  
- Hash: 0x1a2b3c...  
- Previous Hash: 0x000000...

Block 2:  
- Data: "Bob sends 5 coins to Charlie"  
- Hash: 0x4d5e6f...  
- Previous Hash: 0x1a2b3c... (Block 1 hash)

**Key Properties:**

- Immutable** - Changing any block breaks the chain
- Decentralized** - No single point of control
- Transparent** - All transactions are visible
- Secure** - Cryptographically protected

**Simple Example:**

Imagine a notebook shared among friends where:  
- Each page (block) contains transaction records  
- Every page references the previous page number (hash)  
- If someone tries to modify an old page, everyone notices because the page numbers do not match  
- Everyone has a copy, so no single person can cheat

This creates an unbreakable chain of records that everyone can trust without needing a central authority.

### Question 2:

Explain cryptocurrency and its key differences from traditional digital payments.

#### [ANSWER] Answer & Explanation:

Cryptocurrency is digital money that uses cryptography for security and operates on blockchain networks without central authority.

**Traditional Digital Money (Bank Transfer):**

- Alice → Bank → Bob
- Bank verifies Alice has \$100
- Bank deducts \$100 from Alice
- Bank adds \$100 to Bob
- Bank maintains central ledger

**Cryptocurrency Transaction:**

- Alice → Blockchain Network → Bob
- Alice signs transaction with private key
- Network nodes verify signature and balance
- Transaction added to blockchain
- No central authority needed

**Key Differences:**

Aspect	Traditional Digital	Cryptocurrency
Control	Central bank/authority	Decentralized network
Verification	Bank validates	Network consensus
Reversibility	Can be reversed	Irreversible
Privacy	Bank knows all details	Pseudonymous
Availability	Business hours   24/7/365	Borders   Geographic restrictions   Global
Fees	Bank fees   Network fees	Network fees

**Example Cryptocurrencies:**

- Bitcoin (BTC)** - Digital gold, store of value
- Ethereum (ETH)** - Smart contract platform
- Litecoin (LTC)** - Faster Bitcoin alternative

**Benefits:** No intermediaries, global access, programmable money, censorship resistance

### Question 3:

Explain the process of creating and verifying digital signatures with an example.

#### [ANSWER] Answer & Explanation:

Digital signatures use public-key cryptography to prove transaction authenticity without revealing private keys.

**Key Generation Process:**

- Generate random private key (256-bit number)  
Private Key:  $d = 0x1234567890abcdef\dots$
- Calculate public key using elliptic curve  
Public Key:  $Q = d \times G$  (where  $G$  is generator point)  
 $Q = (x, y)$  coordinates on curve
- Create wallet address from public key  
Address = Hash(Public Key)

**Transaction Signing Process:**

- Create transaction  
 $tx = \{ \text{from: "1A1zP1eP5QGefi2DMPTfTL5SLmv7DivfNa", to: "1BvBMSEYstWetqTFn5Au4m4GFg7xJaNVN2", amount: 0.5, fee: 0.001} \}$
- Hash transaction data  
 $txHash = \text{SHA256}(tx) = 0xabc123\dots$
- Sign with private key  
signature =  $\text{sign}(txHash, \text{privateKey})$
- Broadcast transaction + signature

**Verification Process:**

- Receive transaction + signature
- Hash transaction data
- Verify signature using public key  
 $\text{if } (\text{verify}(\text{signature}, txHash, \text{publicKey}) == \text{true}) \{ \text{transaction\_valid} = \text{true} \} \text{ else } \{ \text{transaction\_invalid} = \text{true} \}$

**Security Properties:**

- Authentication** - Proves sender identity
- Non-repudiation** - Sender cannot deny signing
- Integrity** - Detects any data tampering
- Unforgeable** - Cannot create valid signature without private key

**Real-world Analogy:** Like a handwritten signature, but mathematically impossible to forge and can be verified by anyone.



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