Ethereum & Smart Contracts – Quiz

20 Multiple-Choice Questions

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BSc Blockchain, Crypto Economy & NFTs

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Quiz: Questions 1–5

Q1 (Understand). What is a smart contract?
A) A legal agreement between companies B) A program stored on a blockchain that executes automatically when conditions are met
C) A special type of cryptocurrency wallet D) An encrypted message between two parties

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Answer: (B) – Smart contracts are self-executing programs on the blockchain, not legal documents.

Q2 (Understand). What is the key difference between an EOA and a Contract Account on Ethereum?
A) EOAs can hold more ETH than Contract Accounts B) Contract Accounts are controlled by code; EOAs are controlled by private keys
C) Only Contract Accounts can send transactions D) EOAs exist on Bitcoin; Contract Accounts only on Ethereum

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Q3 (Understand). Which statement best distinguishes Ethereum from Bitcoin?
A) Ethereum is faster than Bitcoin in all metrics B) Bitcoin uses accounts while Ethereum uses UTXOs
C) Ethereum supports Turing-complete programmable logic; Bitcoin uses a limited scripting language
D) Only Ethereum uses cryptographic hashing

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Answer: (C) – Ethereum's key innovation is Turing-complete computation on the blockchain.

Q4 (Understand). What is the difference between a token and a coin?
A) Tokens are more valuable than coins B) A coin has its own blockchain; a token lives as a smart contract on another blockchain
C) Coins can only be used for payments; tokens can represent anything D) There is no difference; the terms are interchangeable

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C) Coins can only be used for payments; tokens can represent anything D) There is no difference; the terms are interchangeable
Answer: (B) – BTC and ETH are coins with their own blockchains; USDC and UNI are tokens living on Ethereum.

Q5 (Apply). A simple ETH transfer uses 21,000 gas. If the base fee is 30 gwei and the priority fee is 2 gwei, what is the total transaction cost in gwei?
A) 630,000 gwei B) 672,000 gwei C) 420,000 gwei D) 21,000 gwei

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Answer: (B) – $21{,}000 \times (30 + 2) = 21{,}000 \times 32 = 672{,}000$ gwei ($= 0.000672$ ETH).

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Q6 (Apply). Under EIP-1559, what happens to the base fee when blocks are consistently more than 50% full?
A) It stays the same B) It increases by up to 12.5% per block
C) It decreases to attract more transactions D) It is set by validator vote

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Answer: (B) – EIP-1559 increases the base fee by up to 12.5% per block when utilization exceeds 50%.

Q7 (Apply). Alice wants a DEX to trade 100 USDC for DAI. What is the correct sequence?
A) Alice calls transfer() on the DEX, then the DEX sends DAI
B) Alice calls approve(DEX, 100) on USDC, then calls swap() on the DEX
C) The DEX automatically reads Alice's USDC balance and swaps D) Alice sends USDC directly to the DAI contract

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Answer: (B) – The two-step pattern: first approve the DEX to spend tokens, then call the swap function.

Q8 (Apply). Alice has 100 tokens. She calls transfer(Bob, 30). What are the final balances?
A) Alice: 100, Bob: 30 B) Alice: 70, Bob: 30 C) Alice: 0, Bob: 130 D) Alice: 130, Bob: 0

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Answer: (B) – Transfer subtracts from sender and adds to receiver: Alice $100 - 30 = 70$, Bob $0 + 30 = 30$.

Q9 (Apply). A game studio needs a single contract to handle both in-game currency (fungible) and unique weapons (non-fungible). Which standard is best?
A) ERC-20 for currency, deploy a separate ERC-721 for weapons B) ERC-721 for everything
C) ERC-1155, which supports both fungible and non-fungible tokens in one contract
D) A custom standard that combines ERC-20 and ERC-721

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Answer: (C) – ERC-1155 handles both fungible and non-fungible tokens with batch operations in one contract.

Q10 (Apply). Why does SSTORE (writing to storage) cost approximately 6,000 times more gas than ADD (arithmetic)?
A) Storage operations require more CPU cycles B) Storage data persists on every node forever, while arithmetic is temporary
C) SSTORE was intentionally overpriced to discourage usage D) ADD operations are subsidized by the Ethereum Foundation

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Answer: (B) – Storage writes persist forever across all nodes; arithmetic results are temporary and discarded.

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Q11 (Apply). What is the correct order when deploying a smart contract?
A) Write code, deploy transaction, get address, compile, users interact
B) Write code, compile to bytecode, deploy via transaction, contract gets address, users call functions
C) Compile, write code, deploy, test, get address D) Get address, write code, compile, deploy, test

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A) The private key to access the contract B) A description of the contract's functions and how to call them
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Q13 (Analyze). Why does a reentrancy attack succeed?
A) The attacker breaks the cryptographic hashing
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A) Decentralization B) Immutability C) Transparency D) Composability

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Q14 (Analyze). The Ethereum community hard-forked after The DAO hack. Which principle did this violate?
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Answer: (B) – The fork reversed transactions, violating the principle that blockchain history cannot be changed.

Q15 (Analyze). In a DeFi composability stack, why does a bug in a lending protocol potentially crash a DEX aggregator built on top?
A) They share the same source code
B) The aggregator depends on the lending protocol's contracts, creating cascading failure risk
C) All DeFi protocols share a single database D) DEX aggregators copy the lending protocol's balance sheet

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C) All DeFi protocols share a single database D) DEX aggregators copy the lending protocol's balance sheet
Answer: (B) – Composability means each layer depends on layers below; a failure cascades upward through the stack.

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Q16 (Analyze). Bitcoin uses UTXO while Ethereum uses accounts. What trade-off does Ethereum's account model make?
A) Ethereum sacrifices privacy for simpler smart contract state management
B) Ethereum sacrifices speed for better security
C) Ethereum uses more storage but processes transactions faster
D) There is no meaningful trade-off; accounts are strictly better

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Q17 (Analyze). "Immutability means your best code and your worst bugs both live forever." Why is this simultaneously a feature and a threat?
A) Feature: nobody can change it; Threat: nobody can change it – the same property serves both roles
B) Feature: it is fast; Threat: it is expensive
C) Feature: it is transparent; Threat: it is complicated
D) Feature: it is decentralized; Threat: it is slow

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Answer: (A) – The inability to modify deployed code prevents censorship (feature) but prevents bug fixes (threat).

Q18 (Analyze). DeFi TVL exceeds $120 billion. What does this metric actually represent?
A) The total market capitalization of all DeFi tokens
B) The total value of assets deposited in DeFi smart contracts
C) The daily trading volume across all decentralized exchanges
D) The total fees collected by DeFi protocols

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Answer: (B) – TVL measures crypto assets locked in DeFi protocols, not market cap or trading volume.

Q19 (Evaluate). A company wants to use a smart contract for escrow: hold funds until both parties confirm delivery. Is this appropriate?
A) No, escrow is too complex for smart contracts
B) Yes, this is an ideal use case – clear conditions, automatic execution, transparent rules
C) No, smart contracts cannot hold funds
D) Yes, but only if the contract can be modified after deployment

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Answer: (B) – Escrow with clear conditions is a textbook smart contract use case: hold until condition met, then release.

Q20 (Evaluate). A protocol promises 20% annual yield on staked ETH, funded entirely from new deposits. Applying the safety framework, which question reveals the critical flaw?
A) Question 1: Is it audited?
B) Question 3: Who holds admin keys?
C) Question 4: Oracle dependencies?
D) Question 5: What is the worst-case loss? (Ponzi structure – yield from deposits, not productive activity)

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Answer: (B) – Escrow with clear conditions is a textbook smart contract use case: hold until condition met, then release.

Q20 (Evaluate). A protocol promises 20% annual yield on staked ETH, funded entirely from new deposits. Applying the safety framework, which question reveals the critical flaw?
A) Question 1: Is it audited?
B) Question 3: Who holds admin keys?
C) Question 4: Oracle dependencies?
D) Question 5: What is the worst-case loss? (Ponzi structure – yield from deposits, not productive activity)
Answer: (D) – If yield comes from new deposits rather than productive activity, it is unsustainable – a Ponzi structure.