

Name _____

Unveiling the Magic: How Blockchain Transactions Are Verified

Open-Ended Response Answer Key

1. (Sample answer) The verification of a transaction on the blockchain involves several steps. It begins with the initiation of a transaction, followed by its propagation to the network. Miners use consensus mechanisms, like Proof of Work, to validate the transaction by confirming the sender's balance and digital signature. Once verified, the transaction is added to a block, linked to the previous block, and the network nodes reach consensus on its validity. Finally, the transaction is confirmed and becomes part of the permanent blockchain ledger.
2. (Sample answer) Transparency is essential in blockchain technology because it allows anyone to view transactions on a public ledger, ensuring trust and accountability. This feature benefits various industries, such as supply chain management, where consumers can track the origins of products, or in elections, where voters can verify their ballots. It promotes honesty, reduces fraud, and enhances accountability.
3. (Sample answer) Proof of Work (PoW) consensus mechanism, while secure, consumes significant energy. Challenges include high computational power and environmental concerns. Alternatives like Proof of Stake (PoS) and delegated PoS offer more energy-efficient solutions. PoS verifies transactions based on the amount of cryptocurrency held by participants, reducing energy consumption.
4. (Sample answer) Miners play the role of transaction verifiers, nodes act as witnesses, and consensus mechanisms ensure agreement among network participants. Miners validate transactions by solving complex puzzles, nodes confirm their validity, and consensus mechanisms like PoW ensure only legitimate transactions are added to the blockchain. This collaborative effort ensures the security and reliability of blockchain transactions.

