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Introduction to Consensus Mechanisms

Consensus mechanisms ensure trust in decentralized networks.

DEFINITION

> Consensus mechanisms are protocols that allow a network of computers to agree on a single data value. They are crucial for maintaining the integrity and security of blockchain systems.

KEY CONCEPTS

Proof of Work

A consensus mechanism where miners solve complex mathematical problems to validate transactions.

Proof of Stake

A method where validators are chosen to create new blocks based on the number of coins they hold.

Delegated Proof of Stake

A variation where stakeholders elect delegates to validate transactions on their behalf.

Byzantine Fault Tolerance

A property that ensures a system can reach consensus even if some nodes fail or act maliciously.

Practical Byzantine Fault Tolerance

An approach that allows a network to reach consensus despite some nodes failing or being unreliable.

EXAMPLES

→ Bitcoin uses Proof of Work to secure its network.

→ Ethereum is transitioning from Proof of Work to Proof of Stake.

→ EOS employs Delegated Proof of Stake for faster transactions.

MEMORY TIPS

★ Think 'Work hard' for Proof of Work and 'Stake your claim' for Proof of Stake.

★ Remember 'Delegates do the work' for Delegated Proof of Stake.

★ Byzantine Fault Tolerance sounds complex; visualize a group of friends agreeing despite some being unreliable.

COMMON MISTAKES

✗ Confusing Proof of Work with Proof of Stake.

✗ Overlooking the importance of Byzantine Fault Tolerance.

✗ Assuming all consensus mechanisms are equally secure.

QUICK RECAP

Consensus mechanisms are essential for blockchain integrity, enabling agreement among decentralized nodes. Key types include Proof of Work, Proof of Stake, and Byzantine Fault Tolerance, each with unique characteristics and applications.