Blockchain Technology - Beginner Summary (First 35 Minutes)

1. What is Blockchain?

- A decentralized, distributed ledger technology that records transactions across many computers.

- Ensures that the record cannot be changed retroactively without the alteration of all subsequent blocks.

2. Key Features of Blockchain:

- Decentralization: No central authority controls the data.

- Transparency: All transactions are visible to all participants in the network.

- Immutability: Once data is written to the blockchain, it cannot be changed.

3. How Blockchain Works:

- Transactions are grouped into blocks.

- Each block is cryptographically linked to the previous one using a hash.

- Nodes in the network validate the block using consensus mechanisms (e.g., Proof of Work).

4. Components of Blockchain:

- Blocks: Containers of data.

- Chain: Sequence of blocks linked together.

- Hash Function: SHA-256 is commonly used.

- Node: Any computer participating in the blockchain network.

- Miner: Special nodes that validate transactions and create new blocks.

5. Types of Blockchain:

- Public Blockchain: Open to anyone (e.g., Bitcoin, Ethereum).
- Private Blockchain: Restricted access (e.g., Hyperledger).
- Consortium Blockchain: Controlled by a group of organizations.

6. Use Cases:

- Cryptocurrency (Bitcoin, Ethereum)
- Supply Chain Management
- Digital Identity
- Voting Systems
- Healthcare Data Management

7. Limitations of Blockchain:

- Scalability issues
- High energy consumption (especially PoW)
- Regulation and legal concerns
- Risk of human error in smart contracts

These points summarize what is typically covered in the first 35 minutes of an introductory blockchain tutorial.