Que 1. Choose one platform from each category:

- **Public Blockchain: (e.g., Ethereum, Bitcoin, Solana)**
- **Private Blockchain: (e.g., Hyperledger Fabric, R3 Corda in private mode)**
- **Consortium Blockchain: (e.g., R3 Corda, Quorum, IBM Food Trust)**

Instructions:

1. **Create a comparison table or markdown sheet with the following columns for each platform:**
    - **Blockchain Name**
    - **Type (Public/Private/Consortium)**
    - **Consensus Mechanism Used**
    - **Permission Model (Open/Permissioned)**
    - **Speed / Throughput (TPS if available)**
    - **Smart Contract Support (Y/N + Language)**
    - **Token Support (Native or not)**
    - **Typical Use Case**
    - **Notable Technical Feature (e.g., privacy, pluggable consensus)**

Ans.

Blockchain Name	**Ethereum**	**Hyperledger Fabric**	**R3 Corda**
Type	Public	Private	Consortium
Consensus Mechanism	Proof-of-Stake (PoS) – Validators secure the network by staking ETH.	Pluggable – Commonly uses Raft for leader-based consensus.	Notary-based – Uses a trusted notary node to validate transactions.
Permission Model	Open – Anyone can join and participate.	Permissioned – Access limited to known, approved participants.	Permissioned – Only verified parties can join the network.
Speed (TPS)	15–30 TPS (base); 100,000+ TPS with Layer 2 solutions.	1,000–10,000 TPS, depending on setup and use case.	100–1,000 TPS in typical financial deployments.
Smart Contract Support	Yes – Supports Solidity and Vyper, runs on EVM.	Yes – Chaincode in Go, Java, or JavaScript.	Yes – CorDapps in Kotlin or Java.
Token Support	Native ETH + ERC standards (ERC-20, ERC-721).	No native token; external support possible.	Optional – Token SDK available.
Typical Use Case	DeFi, NFTs, gaming, DAOs, decentralized apps.	Supply chain, healthcare, identity, enterprise systems.	Interbank payments, trade finance, legal agreements.
Notable Technical Feature	EVM compatibility, large ecosystem, Layer 2 scaling.	Privacy via channels, modular consensus and components.	Legal prose support, private peer-to-peer data sharing.

Que 2. Write a Short Report (150–200 words):
Compare and contrast the technical capabilities of each.

Ans. Comparison of Ethereum, Hyperledger Fabric, and R3 Corda

Ethereum, Hyperledger Fabric, and R3 Corda represent three distinct blockchain types—public, private, and consortium—each with unique technical capabilities.

1. Ethereum

- A public blockchain, uses Proof-of-Stake (PoS) for consensus, offering 15–30 TPS (scalable via Layer 2 solutions). It supports smart contracts (Solidity/Vyper) and native tokens (ETH + ERC-20), making it ideal for DeFi, NFTs, and dApps. Its key strength is decentralization, though it sacrifices speed and privacy.

2. Hyperledger Fabric

- A private blockchain, employs a pluggable consensus (e.g., Raft) and achieves 1,000–10,000 TPS. It supports smart contracts in Go/Java/JS but lacks native tokens. Designed for enterprises, it ensures privacy via channels, making it suitable for supply chain and healthcare.

3. R3 Corda

- A consortium blockchain, uses a notary-based consensus and processes 100–1,000 TPS. It supports smart contracts (Kotlin/Java) and optional tokenization. Optimized for financial and legal agreements, it enforces need-to-know data privacy and integrates legal prose.

Que 3. Which platform would you choose for:

- **A decentralized app?**
- **A supply chain network among known partners?**
- **An inter-bank financial application?**

Justify your choice based on technical points.

Ans.
1. Decentralized App (DApp)

Choice: Ethereum

- **Open Permissionless Model**: Allows anyone to participate (critical for DApps).
- **Smart Contract Support**: Solidity/Vyper enable complex logic (DeFi, NFTs).
- **Tokenization**: Native ETH + ERC-20 standard for token economies.
- **L2 Scaling**: Rollups (e.g., Arbitrum) mitigate low base-layer TPS (~15–30).
- **Network Effects**: Largest developer ecosystem and interoperability standards.

2. Supply Chain Network Among Known Partners

Choice: Hyperledger Fabric

- **Permissioned Model**: Only authorized partners join (enterprise requirement).
- **High Throughput**: 1,000–10,000 TPS handles supply chain data volume.
- **Channels**: Isolate sensitive data (e.g., supplier contracts).
- **No Native Token**: Avoids regulatory complexity for enterprise use.
- **Pluggable Consensus**: Tailor consensus (e.g., Raft) to partner needs.

3. Inter-Bank Financial Application

Choice: R3 Corda

- **Consortium Model**: Banks retain control (vs. public chains).
- **Notary-Based Consensus**: Deterministic finality (no forks, critical for finance).
- **Privacy**: Only parties to a transaction see data (vs. Fabric's channel overhead).
- **Legal Prose Integration**: Enforce real-world contracts on-chain.
- **Tokens SDK**: Optional asset tokenization (e.g., CBDCs, securities).