Name- VAISHNAVI VERMA

Group - B

**TASK -2**

Ques1)

**Blockchain Platform Comparison**

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| Feature | Ethereum | Hyperledger Fabric | R3 Corda |
| Type | Public Blockchain | Private Blockchain | Consortium Blockchain |
| Consensus Mechanism | Proof of Stake (PoS) | Pluggable (e.g., Raft, PBFT) | Notary Service (Uniqueness Consensus) |
| Permission Model | Open / Permissionless | Permissioned | Permissioned |
| Speed / Throughput | ~15-30 TPS (Layer 1) | Thousands to tens of thousands of TPS | Hundreds to ~1000 TPS (Enterprise) |
| Smart Contract Support | Yes (Solidity) | Yes (Go, Node.js/JavaScript, Java) | Yes (Java, Kotlin) |
| Token Support | Native (ETH), extensive custom (ERC-20+) | Yes (via Chaincode / Token SDK) | Yes (via Token SDK) |
| Typical Use Case | DeFi, NFTs, DAOs, general dApps, ICOs | Supply Chain, Trade Finance, Identity, IoT | Financial Services (Inter-bank, Capital Markets, Insurance) |
| Notable Technical Feature | Ethereum Virtual Machine (EVM), large ecosystem, Layer 2 scaling | Channels for privacy, modular architecture, private data | Privacy-by-design (point-to-point transactions), legal enforceability focus |

Ques2)

Ethereum, Hyperledger Fabric, and R3 Corda represent distinct approaches to blockchain technology. Ethereum, a public, permissionless network, prioritizes decentralization and transparency. Its Proof of Stake consensus and robust EVM enable complex smart contracts in Solidity, fostering a vibrant ecosystem for DeFi and dApps. However, its Layer 1 throughput is relatively low, often necessitating Layer 2 solutions for scalability.

Hyperledger Fabric, a private, permissioned blockchain, focuses on enterprise needs. Its modular architecture allows pluggable consensus mechanisms (like Raft) and multi-language smart contracts (Chaincode), offering high throughput and fine-grained privacy via channels. Participants are known, ensuring accountability. R3 Corda, a consortium blockchain, is tailored for regulated industries, particularly finance. It emphasizes privacy with point-to-point transactions and a unique Notary Service for uniqueness consensus, supporting legally enforceable CorDapps in Java/Kotlin. Its performance is optimized for high-value financial transactions.

For a **decentralized app**, I would choose **Ethereum**. Its open, permissionless nature, massive developer community, and established token standards (ERC-20, ERC-721) are ideal for public-facing dApps where censorship resistance and broad participation are paramount. Layer 2 solutions address its scalability concerns.

For a **supply chain network among known partners**, **Hyperledger Fabric** is the best choice. Its permissioned model ensures only authorized entities participate, channels provide necessary data privacy between specific parties (e.g., manufacturer and supplier), and its high transaction throughput can handle the volume required for complex supply chains.

For an **inter-bank financial application**, **R3 Corda** would be superior. Its design, with privacy-by-default point-to-point transactions and a notary service, directly addresses the strict confidentiality and regulatory requirements of the financial sector. Its focus on legal enforceability and integration with existing systems makes it highly suitable for high-value, sensitive inter-bank operations.