



School: Campus:

Academic Year: Subject Name: Subject Code:

Semester: Program: Branch: Specialization:

Date:

Applied and Action Learning

(Learning by Doing and Discovery)

Name of the Experiment : Chains Beyond Ethereum – Platform Comparisons

Objective/Aim:

To study and compare various blockchain platforms apart from Ethereum by deploying a sample smart contract on each and analyzing differences in performance factors such as transaction cost, confirmation speed, and consensus model.

Apparatus/Software Used:

- Remix IDE
- MetaMask
- Ethereum testnet (Goerli / Sepolia)
- Polygon Mumbai Testnet
- Binance Smart Chain (BSC) Testnet
- Avalanche Fuji Testnet

Theory/Concept:

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While **Ethereum** remains the most popular platform for smart contracts, several other blockchains have been developed to overcome its limitations in terms of scalability, cost, and transaction speed.

Each blockchain has a unique **consensus mechanism**, **fee structure**, and **interoperability model**, making it suitable for different decentralized application (DApp) use cases.

Comparison Factors:

1. Gas Fee Cost:

The transaction fee required to execute operations on the blockchain.

2. Confirmation Time:

The average time taken for a transaction to be confirmed.

3. Consensus Algorithm:

The method used by the blockchain network to achieve agreement (e.g., PoS, PoSA, Avalanche).

4. Scalability & Interoperability:

The ability of a blockchain to handle large transaction volumes and interact with other networks.

Comparing these parameters helps determine the most efficient platform for smart contract deployment.

Procedure:

② Open Remix IDE

- Launch **Remix IDE** in a browser and create a sample Solidity contract (e.g., “Storage.sol”).

③ Prepare MetaMask Wallet

- Configure MetaMask for multiple networks (Ethereum, Polygon, BSC, Avalanche).
- Add corresponding RPC URLs and chain IDs manually.

④ Deploy the Smart Contract

- Deploy the same contract on each network:
 - Ethereum Goerli/Sepolia Testnet
 - Polygon Mumbai Testnet
 - Binance Smart Chain Testnet
 - Avalanche Fuji Testnet

⑤ Record Key Metrics

- Note the gas fees, confirmation times, and consensus types for each network.

⑥ Analyze Performance

- Compare transaction cost, execution speed, and scalability.

⑦ Conclude

- Determine which blockchain provides the best balance of speed, cost, and decentralization for DApp deployment.

Observation Table:

| Blockchain | Gas Fee | Confirmation Time | Consensus | Remarks |
|---------------------------|----------|-------------------|-------------------------------|--|
| Ethereum | High | ~15 sec | PoS | Most secure, widely adopted |
| Polygon | Very Low | ~2 sec | PoS | Fast, low-cost, Ethereum Layer-2 ecosystem |
| BSC (Binance Smart Chain) | Low | ~3 sec | PoSA | Highly scalable, centralized validators |
| Avalanche | Medium | ~4 sec | Snowman / Avalanche Consensus | High throughput, strong interoperability |

ASSESSMENT

| Rubrics | Full Mark | Marks Obtained | Remarks |
|--|-----------|----------------|---------|
| Concept | 10 | | |
| Planning and Execution/ Practical Simulation/ Programming | 10 | | |
| Result and Interpretation | 10 | | |
| Record of Applied and Action Learning | 10 | | |
| Viva | 10 | | |
| Total | 50 | | |

Signature of the Faculty:

Signature of the Student:
 Name : _____
 Regn. No. _____