



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 : Stake Your Claim – Proof of Stake Simulation

Objective/Aim:

To simulate the working of the Proof of Stake (PoS) consensus mechanism by selecting validators based on their stake amount and verifying block creation without performing intensive computations like Proof of Work (PoW).

Apparatus/Software Used:

- Laptop
- Remix IDE
- MetaMask
- Vs code

Theory/Concept:

Proof of Stake (PoS) is a consensus mechanism in blockchain that selects a validator to create the next block based on the amount of cryptocurrency they “stake” as collateral.

Unlike Proof of Work (PoW), which depends on computational power, PoS depends on ownership (stake).

The higher the stake, the higher the chance of being chosen to validate a block.

Key Concepts:

Stake: Amount of coins locked by a validator.

Validator: A node chosen to create and verify a block.

Block Proposal: The chosen validator proposes a new block.

Consensus: Other validators verify the block before it's added to the chain.

Advantages of PoS:

Energy-efficient

Reduced hardware costs

Lower chances of centralization

Faster block creation times

Procedure:

Initialize Validators:

- Define multiple participants with different stake values.

Calculate Selection Probability:

- Each validator's probability = (individual stake / total stake).

Random Validator Selection:

- Choose one validator based on weighted probability (more stake → higher chance).

Block Validation:

- The chosen validator creates and validates a block.

Reward Distribution:

- The selected validator earns a reward added to their stake.

Repeat Process:

- Continue for multiple rounds to simulate continuous PoS block creation.

Observation Table:

S.No	Validator Name	Initial Stake	Rounds Won	Final Stake	Probability of Selection
1	Alice	50	3	80	0.5
2	Bob	30	1	40	0.3
3	Charlie	20	1	30	0.2

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		