



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 understand how validators are selected in the Proof of Stake (PoS) consensus mechanism and how staking influences block creation.

### **Apparatus/Software Used:**

- Laptop
- Remix IDE
- MetaMask
- Vs code

### **Theory/Concept:**

#### 1. What Is Proof of Stake (PoS)?

Proof of Stake (PoS) is a consensus mechanism — a method for a blockchain network to agree on which transactions are valid and which block should be added next.

Instead of using massive computational power (like in Proof of Work), PoS uses economic commitment. Validators lock up (or “stake”) their coins as collateral to earn the right to validate transactions.

#### 2. How Validators Are Chosen

In PoS, validators replace miners.

- Each validator must stake a certain minimum number of tokens (for example, 32 ETH in Ethereum).
  - The network then randomly selects one validator (or a group of them) to propose the next block.
  - The chance of being selected is proportional to the size of your stake.

Example: If you stake 1% of the total staked coins, you have roughly a 1% chance to create the next block.

So — more stake = more trust = more opportunity to validate.

**Procedure:**

Step 1:

**Set Up 3 Validators:**

Validator A stakes 10 tokens

Validator B stakes 30 tokens

Validator C stakes 60 tokens

Step 2:

**Simulate Validator Selection:**

Generate a random weighted selection based on stake size.

Higher stake = higher probability of being selected.

Step 3:

**Block Validation:**

Selected validator creates and proposes a block.

Other validators confirm and add it to their ledger.

Step 4:

**Reward Distribution:**

Validator receives 2% of the block reward proportional to stake.

**Observation Table:**

| Validator | Stake (Tokens) | Selection Probability | Block Reward | Updated Balance |
|-----------|----------------|-----------------------|--------------|-----------------|
| A         | 10             | 10%                   | 0.2          | 10.2            |
| B         | 30             | 30%                   | 0.6          | 30.6            |
| C         | 60             | 60%                   | 1.2          | 61.2            |

**ASSESSMENT**

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

*Signature of the Student:*

Name :

Regn. No.

*Signature of the Faculty:*