Centurion University
Shaping Lives... Empowering Communities...

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 Experiement : PoW vs PoS – Consensus Mechanism Comparison

Objective/Aim:

To study, understand, and compare the working, advantages, disadvantages, and efficiency of **Proof of Work (PoW)** and **Proof of Stake (PoS)** consensus mechanisms used in blockchain networks.

Apparatus/Software Used:

- Laptop/PC
- Word for documentation
- Brave browser for research

Theory/Concept:

1. **Proof of Work (PoW)**

- **Definition:** A consensus mechanism where network participants (miners) compete to solve complex mathematical puzzles.
- **Purpose:** To validate transactions and create new blocks on the blockchain.
- **Working:**
  - Miners use computational power to solve cryptographic problems.
  - The first to solve it gets the right to add a new block and receive rewards.
- **Examples:** Bitcoin, Litecoin.

2. **Proof of Stake (PoS)**

- **Definition:** A consensus mechanism where validators are chosen to create new blocks based on the amount of cryptocurrency they "stake" (lock up) as collateral.
- **Purpose:** To secure the network and validate transactions with less energy usage.
- **Working:**
  - Validators are selected randomly, weighted by stake amount.
  - Misbehavior (e.g., fraudulent transactions) can result in loss of stake.
- **Examples:** Ethereum 2.0, Cardano, Polkadot.

Procedure:

- Research and collect detailed information on both PoW and PoS from blockchain whitepapers, technical blogs, and case studies.
- Study the working principles and steps involved in each consensus mechanism.
- Identify their respective advantages, disadvantages, and security measures.
- Compare the energy usage, transaction speed, scalability, and decentralization aspects.
- Record findings in an observation table for clear comparison.

Observation Table:

Parameter	PoW	PoS
Selection	Puzzle solving	Coin stake
Energy Use	High	Low
Speed	Slow	Fast
Security	Very High	High
Examples	Bitcoin, Litecoin	Ethereum 2.0, Cardano

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		
[redacted]	10		
[redacted]			

Signature of the Student:

Name :

Regn. No. :

Signature of the Faculty: