Centurion University

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 : Smart Libraries – Libraries and Proxy Contracts

* Coding Phase: Pseudo Code / Flow Chart / Algorithm

- Start
- Create a library with a function (e.g., addition)
- Create a main contract that uses the library
- Deploy and execute library functions through the main contract
- Implement a proxy contract calling another logic contract using delegatecall
- Observe reusability and upgradability
- End

* Software used

- Remix IDE
- MetaMask (optional)
- JavaScript VM (EVM Simulator)
-

*As applicable according to the experiment.
Two sheets per experiment (10-20) to be used.

* Implementation Phase: Final Output (no error)

- Deploy the **Library** (e.g., MathLib.sol).
- Deploy the **Logic Contract** using the library functions.
- Deploy the **Proxy Contract** that points to the logic contract's address.
- Call a function (e.g., addNumbers(2,3)) from the proxy.
- Proxy forwards the call via delegatecall → executes in the logic contract.
- Output (e.g., 5) is returned to the user, but the state is stored in the proxy.
- If logic needs updating, deploy a new **Logic V2 contract** and update the proxy to point to it.
- Users continue using the same proxy address, but new logic executes.

* Observations:

- Libraries enable reusability and reduce code duplication.
- They also help in gas optimization since logic is reused across contracts.
- Proxy Contracts allow contracts to be upgraded without changing the address.
- The delegatecall function executes logic from another contract while preserving the Proxy's state.
- These patterns are used in modular and upgradeable smart contract architectures.

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 Student:

Name :

Regn. No. :

Signature of the Faculty:

**As applicable according to the experiment. Two sheets per experiment (10-20) to be used.*