School: .... Campus: ....

Academic Year: .... Subject Name: .... Subject Code: ....

Semester: .... Program: .... Branch: .... Specialization: ....

Date: ....

Centurion UNIVERSITY
Shaping Lives...
Empowering Communities...

Applied and Action Learning
(Learning by Doing and Discovery)

Name of the Experiement : Blockchain Dev Tools – Setting Up Environment

Objective/Aim:

To understand how to set up a blockchain development environment using **Remix IDE**, MetaMask, and Solidity, and to compile, deploy, and test smart contracts directly in the browser without installing local tools.

Apparatus/Software Used:

1. Laptop/PC
2. Web browser (Chrome/Brave recommended)
3. Remix IDE (online)
4. MetaMask Wallet
5. Internet connection

Theory/Concept:

Remix IDE is a browser-based Ethereum smart contract development environment.
It allows developers to:

- Write Solidity smart contracts
- Compile code
- Deploy to local VM or real test networks
- Debug and test transactions
- Connect with MetaMask for blockchain interaction

Key Components

☑ **Solidity Compiler**
Converts Solidity code into EVM bytecode & ABI.

☑ **Deploy & Run Module**
Allows deployment on:

- JavaScript VM (local blockchain)
- Injected Provider (MetaMask)
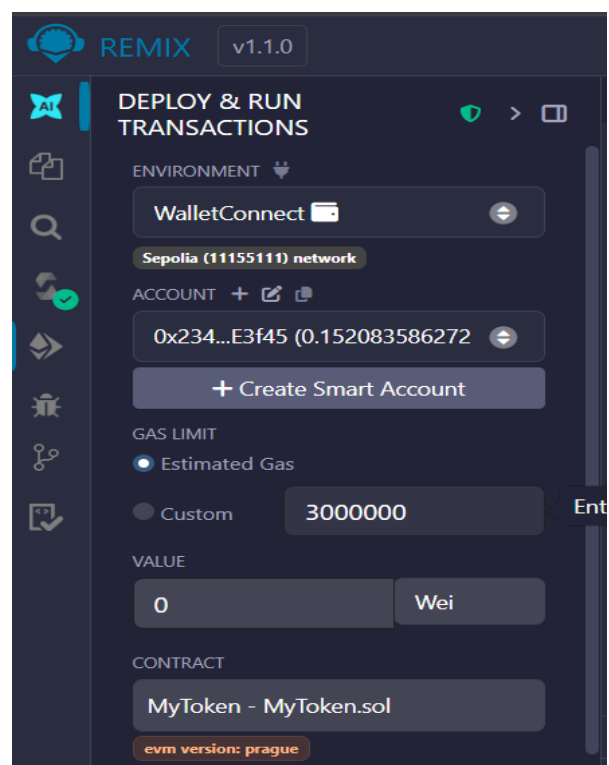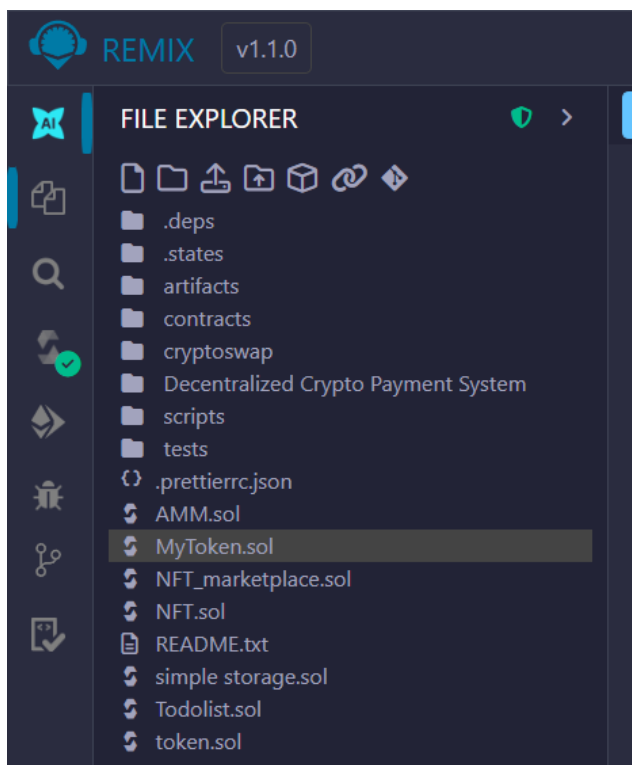- External RPC networks (Sepolia, etc.)

☑ **MetaMask**
Used for signing and sending real blockchain transactions on testnets.

- Learning Solidity
- Building dApps (payment systems, tokens, NFTs)
- Testing contract deployment

Procedure:

1. **Open Remix IDE**
   Go to the website:
   https://remix.ethereum.org
2. **Create a new Solidity file**
3. In the contracts folder
4. Create a file, e.g., MyContract.sol
5. Write your smart contract code
6. **Select Solidity Compiler**
7. Choose the correct compiler version (e.g., 0.8.20)
8. Click **Compile MyContract.sol**
9. **Install MetaMask**
10. Add MetaMask extension
11. Create wallet
12. Switch to a test network (e.g., Sepolia)
13. Get free test ETH from a faucet
14. **Deploy the Smart Contract**
15. Go to **Deploy & Run Transactions**
16. Select Environment:
    - ☑ *JavaScript VM* (local blockchain)
    - ☑ *Injected Provider* (MetaMask – to deploy on testnet)
17. Click **Deploy**
18. **Interact with the Contract**
    - o After deployment, functions appear in the interface
    - o Use buttons to send transactions or call functions
    - o Observe contract behavior on Remix & MetaMask
- **18 Check blockchain data** (for testnet deployment)
    - o Open MetaMask transaction history
    - o Copy transaction hash
    - o Paste into Etherscan testnet explorer to verify deployment

Observation

- Remix IDE allows developing without installing any local tools.
- The compiler always produces **bytecode** + **ABI** for contracts.
- Deployment on JavaScript VM is instant and does not cost gas.
- Deployment on real testnets requires signing transactions via MetaMask.
- Each deployment generates a **unique contract address**.

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 :

Signature of the Faculty:
Regn. No.