Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations – MAY 2025

Date: 27-05-2025 **Time:** 09:30 am – 12:30 pm

School: SOCSE	**Program**: B. Tech in Computer Science & Engineering	
Course Code : CSE3020	**Course Name:** Smart Contract and Solidity	
Semester: VI	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**
Marks	**6**	**26**	**38**	**30**

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	Define a smart contract.	**2 Marks**	**L1**	**CO1**
2.	List the basic data types in Solidity	**2 Marks**	**L1**	**CO1**
3.	Identify three special variables available in Solidity contracts.	**2 Marks**	**L1**	**CO1**
4.	What is the purpose of the msg.sender variable in Solidity?	**2 Marks**	**L1**	**CO2**
5.	Name a few Ethereum clients.	**2 Marks**	**L1**	**CO2**
6.	Describe how transactions are processed in Ethereum.	**2 Marks**	**L2**	**CO2**
7.	Differentiate between contract deployment and contract execution.	**2 Marks**	**L2**	**CO3**
8.	Explain the structure of a Solidity smart contract.	**2 Marks**	**L2**	**CO3**
9.	Explain what the “proof of ownership” contract ensures.	**2 Marks**	**L2**	**CO3**
10.	Describe the function of Web3.js in Ethereum DApps.	**2 Marks**	**L2**	**CO3**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	Analyze how the structure of a Solidity file supports modular programming.	**10 Marks**	**L4**	**CO 4**
		Or			
12.	**a.**	Examine how control structures in Solidity affect contract behavior.	**10 Marks**	**L4**	**CO 4**
13.	**a.**	Identify the use of modifiers for access control—are they always the best option?	**10 Marks**	**L4**	**CO 3**
		Or			
14.	**a.**	Distinguish the risks and tradeoffs of deploying contracts on public testnets before mainnet.	**10 Marks**	**L4**	**CO 3**
15.	**a.**	Compare the gas costs of various storage patterns in Solidity (e.g., mapping vs. struct arrays).	**10 Marks**	**L4**	**CO 2**
		Or			
16.	**a.**	Compare how external libraries and contracts differ in deployment, gas, and access.	**10 Marks**	**L4**	**CO 2**
17.	**a.**	Determine the lifecycle of a transaction from a MetaMask wallet to execution in the EVM.	**10 Marks**	**L3**	**CO 2**
		Or			
18.	**a.**	Examine how using require vs assert affects gas usage and debugging.	**10 Marks**	**L3**	**CO 2**
19.	**a.**	Classify a Solidity inheritance structure where a base contract defines access control, and child contracts enforce it.	**20 Marks**	**L2**	**CO 3**
		Or			
20.	**a.**	Explain a DApp interface using Web3.js that interacts with a deployed smart contract with dynamic inputs.	**20 Marks**	**L2**	**CO 3**
21.	**a.**	Demonstrate a contract that stores user profiles and allows updating only by the respective user address.	**20 Marks**	**L3**	**CO 4**
		Or			
22.	**a.**	Employ a Solidity smart contract that tracks asset ownership and allows only the owner to transfer it.	**20 Marks**	**L3**	**CO 4**