(c) Describe any three current real-world applications of ethereum such as defi, supply chain management and digital identity system.

5. (a) Define smart contracts. Explain how they are deployed, executed and used to build decentralized applications.

(b) Describe how smart contracts can interact with other contracts and external data sources.

(c) Explain how remix java script VM differes from deplaying on the ethereum test network.

6. (a) Explain how ethereum addresses and transactions are handled within a smart contract.

(b) Explain how constructors and modifiers are used in solidity with examples.

(c) Compare public, private, and internal visibility in solidity functions and variables.

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Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 44011 Roll No.

B. Tech Examination 2025-26

(Odd Semester)

SMART CONTRACT ESSENTIALS

Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION–A

1. Attempt all parts of the following : $1 \times 8 = 8$

(a) What is the native cryptocurrency used in the ethereum network?

(b) Who is the founder of ethereum?

(c) What is the main function of the EVM?

(d) What does a smart contract do on the ethereum block chain?

(e) What is the role of ges in ethereum transactions?

(f) What is the difference between an externally owned account (EOA) and a contract account?

(g) Name one tool used to deploy and test smart contracts on ethereum.

(h) What programming language is most commonly used to write ethereum smart contracts?

SECTION – B

2. Attempt any two parts of the following . $2 \times 6 = 12$

(a) Explain the architecture of ethereum and describe its main components.

(b) Comapre ethereum with bit coin in terms of purpose, transaction model, and programmability.

(c) Discuss the mining and validation process in the ethereum network before and after the merge.

(d) Explain the steps involved in creating and testing smart contracts using remix and javascript VM.

SECTION – C

Note:- Attempt any two parts from each question. Each part carry equal marks. $8 \times 5 = 40$

3. (a) Describe the type of ethereum account and explain how account management is handled in clients?

(b) What is the ethereum virtcal machine? Explain how it executes smart contracts.

(c) Describe the structure of a solidity source file and explain data types, control structure, and exception handling.

4. (a) Explain the architectural overview of the decentralized autonomous organizations (DAO)? Explain their structure and governance mechanism.

(b) Explain the role and importance of developer tools like remix IDE, metamask, web 3.js, and ethereum wallet in DAPP development.

[P. T. O.