M.Sc. (IT) (Sem-IV)   July-2023

Information Technology : Blockchain

(2½ Hours)   **[Total Marks: 60]**

N. B.:
   (1) **All** questions are **compulsory**.
   (2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
   (3) Answers to the **same question** must be **written together**.
   (4) Numbers to the **right** indicate **marks**.
   (5) Draw **neat labeled diagrams** wherever **necessary**.
   (6) Use of **Non-programmable** calculators is **allowed**.

Q1. Attempt the three of the following.   **12 Marks**

a. Discuss the decentralized system. Explain the mechanism of the same.

b. Explain The layered structure of the blockchain architecture.

c. Write a short note on Prisoner's dilemma.

d. What is the game theory of Bitcoin?

Q2. Attempt the three of the following.   **12 Marks**

a. What is EVM? Discuss its utility.

b. What is UTXO? Explain with an example.

c. Bitcoin vs. Ethereum: What's the Difference?

d. Explain GAS in a transaction in detail.

Q3. Attempt the three of the following.   **12 Marks**

a. With the help of a small case study, explain Hyperledger.

b. Write a short note on Private blockchain. Give its characteristics.

c. By taking real-world scenarios, explain the working of Smart contracts.

d. What is Private blockchain? Write its characteristics.

Q4. Attempt the three of the following. 12 Marks

a. What is cryptoeconomics? Explain all domains of crypto-economics.

b. How the proof of work helps regulate block time?

c. What are the factors required for blockchain?

d. Write a short note on Uncle's rules and Rewards.

Q5. Attempt the three of the following. 12 Marks

a. Differentiate between public nodes and self-hosted nodes.

b. What are the steps to develop DApps? List and explain.

c. How to interact with the Bitcoin blockchain using block explorer API?

d. Write a smart contract using solidity programming to implement the concept of a voting system.

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