USN

206CS006

Ph.D./M.S. (Engg.) by Research Degree Examination, Nov./Dec.2024
Blockchain Technology

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Define consensus. Explain the various requirements to be met in order to provide desired results in a consensus mechanism. **(06 Marks)**

b. Define Blockchain. Discuss with a neat diagram generic structure of a blockchain. **(07 Marks)**

c. Describe the challenges and limitations of blockchain. **(07 Marks)**

OR

2 a. Explain in detail why distributed system can not have all three properties at the same time. **(06 Marks)**

b. Discuss any features of Blockchain. **(07 Marks)**

c. Discuss the various ideas that helped with the invention of bitcoin and blockchain with a neat diagram. **(07 Marks)**

Module-2

3 a. Explain the framework proposed by Arvind Narayanan to evaluate the decentralization requirements. **(06 Marks)**

b. Explain different types of security protocols. **(06 Marks)**

c. Discuss SHA256 algorithm with neat diagram. **(08 Marks)**

OR

4 a. Write the difference between centralized and decentralized system. Explain decentralization using blockchain. **(06 Marks)**

b. Discuss security properties of hash functions with an example. **(05 Marks)**

c. What is the use of digital signature? How it is calculated? Explain with a neat diagram generic digital signature. **(09 Marks)**

Module-3

5 a. Explain different types of wallets. **(10 Marks)**

b. Discuss various limitations in bitcoin. **(10 Marks)**

OR

6 a. Illustrate with a table, transaction structure. Also write transaction life cycle. **(10 Marks)**

b. Explain mining. Discuss several tasks that a bitcoin miner performs. **(10 Marks)**

Module-4

7 a. List and explain four properties of smart contract. Also write a note on Ricardian contracts. **(10 Marks)**

b. Illustrate with diagrams:

i) Ethereum stack showing various components

ii) Ethereum state transition function. **(10 Marks)**

OR

8 a. Define transactions in ethereum. Discuss two types of transaction. Explain common fields in the transactions. **(10 Marks)**

b. Write a note:
   i) Deploying smart contract on a blockchain
   ii) The DAO. **(10 Marks)**

Module-5

9 a. Illustrate with a diagram consensus mechanism in Kadena. **(10 Marks)**

b. Explain five layer mode used to describe IOT with a neat diagram. **(10 Marks)**

OR

10 a. Discuss automated border control system briefly. **(10 Marks)**

b. Briefly explain applications of blockchain in different sectors. **(10 Marks)**

* * * * *