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21CS734

## Seventh Semester B.E./B.Tech. Degree Examination, Dec.2025/Jan.2026 Block Chain Technology

Max. Marks: 100

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

### Module-1

- 1 a. Describe distributed systems. Explain the Byzantine generals problem. (07 Marks)
- b. Illustrate the generic structure of a block using a well-labeled diagram and explain. (07 Marks)
- c. Discuss the overview of decentralized ecosystem with a neat diagram. (06 Marks)

OR

- 2 a. List and explain any four benefits and limitations of blockchain. (06 Marks)
- b. Illustrate any six consensus algorithms in blockchain. (06 Marks)
- c. Briefly explain Decentralized Organization. (08 Marks)

### Module-2

- 3 a. Define cryptographic hash functions and discuss their significance in the Bitcoin. (07 Marks)
- b. Analyze the proof of work mechanism in Bit coin and summarize its key properties. (06 Marks)
- c. Define Merkle tree and explain how it facilitates efficient transaction verification within the Bitcoin. (07 Marks)

OR

- 4 a. Illustrate digital signature schemes. (05 Marks)
- b. Outline the concept of goofy coin creation and describe how its transaction process work. (08 Marks)
- c. Interpret the concept of distributed consensus in Bitcoin, explaining how the network achieves agreement on blockchain states. (07 Marks)

### Module-3

- 5 a. Compose a Bit coin script and demonstrate the execution process in detail. (05 Marks)
- b. Discuss in detail the limitations and improvements in bitcoin. (10 Marks)
- c. Explain how secret key splitting and sharing can be achieved for Bitcoin. (05 Marks)

OR

- 6 a. Discuss in detail the applications of Bitcoin scripts. (10 Marks)
- b. Depict the payment process in betcoin with a neat diagram and explain in detail. (10 Marks)

### Module-4

- 7 a. Differentiate between CPU and GPU mining, highlighting their distinct characteristics and performance. (06 Marks)
- b. Explain minting and spending a zerocoin with a neat diagrams. (10 Marks)
- c. Analyze the need for anonymity ? Explain the ethics of anonymity. (04 Marks)

OR

- 8 a. Illustrate a forking attack in Bitcoin and explain its implications for the network. (10 Marks)
- b. Describe methods used to de-anonymize bitcoin transactions and analyze the effectiveness of these methods. (10 Marks)

### Module-5

- 9 a. Illustrate the Ricardian contract bowtie model with a well-labeled diagram and explain. (10 Marks)
- b. Explain any ten categories of operations in EVM with an example. [ opcode and meaning should be specified]. (10 Marks)

OR

- 10 a. Define smart contracts and mention its properties. (05 Marks)
- b. Explain Ethereum blockchain with a neat diagram. (10 Marks)
- c. Discuss precompiled contracts for Ethereum. (05 Marks)

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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.