GUJARAT TECHNOLOGICAL UNIVERSITY

MCA INTEGRATED – SEMESTER VII- EXAMINATION –SUMMER-2025

Subject Code: 2678605   **Date: 06/06/2025**
Subject Name: Block Chain Technology
Time:02:30 PM TO 05:00 PM   **Total Marks: 70**

Instructions:

1. Attempt all questions.
2. Make Suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of simple calculators and non-programmable scientific calculators are permitted.

Q.1	**(a)** Define blockchain and elaborate on the architecture behind it	**07**
	(b) What is a hash function and give a comprehensive explanation of how message authentication codes work?	**07**
Q.2	**(a)** Discuss the core fundamentals and characteristics that define blockchain	**07**
	(b) Describe DLT and the functioning of decentralized applications and databases in it	**07**
	OR	
	(b) Describe the key concepts of the Ethereum blockchain.	**07**
Q.3	**(a)** Explain the techniques behind Byzantine agreement methods	**07**
	(b) Discuss the working mechanisms of symmetric and asymmetric cryptography.	**07**
	OR	
Q.3	**(a)** Describe what a consensus algorithm is and explain Proof of Work and Proof of Stake	**07**
	(b) Define Bitcoin and explain the following concepts: Bitcoin address, Bitcoin wallets, and the Bitcoin network.	**07**
Q.4	**(a)** Describe the detailed concept of a smart contract.	**07**
	(b) Explain the layout and structure of a Bitcoin block	**07**
	OR	
Q.4	**(a)** What is a Merkle tree, and how does it work?	**07**
	(b) What are the key characteristics of smart contracts?	**07**
Q.5	**(a)** List various blockchain applications and provide an explanation of its use in the healthcare field.	**07**
	(b) How does blockchain improve the effectiveness of robotic process automation?	**07**
	OR	
Q.5	**(a)** How is blockchain applied in the insurance sector?	**07**
	(b) Explain the following concepts: (i) Blockchain and IoT (ii) Blockchain and Machine Learning	**07**

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