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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E.

Semester: V

Branch: Information Science and Engineering

Duration: 3 hrs.

Course Code: 23IS5PEBCT

Max Marks: 100

Course: Block Chain Technology

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I			CO	PO	Marks
1	a)	Define Blockchain and explain its importance.	<i>CO1</i>	<i>PO1</i>	5
	b)	Differentiate between centralized and decentralized systems with examples.	<i>CO2</i>	<i>PO2</i>	7
	c)	Evaluate the adoption of Blockchain technology and propose potential future applications.	<i>CO3</i>	<i>PO3</i>	8
OR					
2	a)	Describe the layers of Blockchain with their functions.	<i>CO1</i>	<i>PO1</i>	5
	b)	Analyze the limitations of centralized systems that Blockchain aims to address.	<i>CO2</i>	<i>PO2</i>	7
	c)	Compare and contrast Blockchain use cases in different industries.	<i>CO2</i>	<i>PO2</i>	8
UNIT - II					
3	a)	Explain symmetric key cryptography with an example.	<i>CO1</i>	<i>PO1</i>	5
	b)	Analyze the differences between MAC and HMAC, and their use in Blockchain	<i>CO2</i>	<i>PO2</i>	7
	c)	Justify the need for asymmetric key cryptography in secure communications.	<i>CO2</i>	<i>PO2</i>	8
OR					
4	a)	Define cryptographic hash functions and their role in Blockchain.	<i>CO1</i>	<i>PO1</i>	5
	b)	Illustrate the Diffie-Hellman key exchange process.	<i>CO1</i>	<i>PO1</i>	7
	c)	Compare symmetric and asymmetric key cryptography, highlighting their advantages in Blockchain.	<i>CO2</i>	<i>PO2</i>	8
UNIT - III					
5	a)	Describe Nash Equilibrium with a real-life example.	<i>CO1</i>	<i>PO1</i>	5

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

	b)	Discuss the Byzantine Generals' Problem and its relevance to Blockchain.	CO1	PO1	7
	c)	Evaluate how game theory concepts influence the design of Blockchain consensus mechanisms.	CO3	PO3	8
		OR			
6	a)	Define Merkle Trees and explain their purpose in Blockchain.	CO1	PO1	5
	b)	Analyze the concept of zero-sum games and their implications for Blockchain systems.	CO2	PO2	7
	c)	Discuss the challenges and solutions for scaling Blockchain systems.	CO1	PO1	8
		UNIT - IV			
7	a)	Summarize the history of Bitcoin and its significance.	CO1	PO1	5
	b)	Explain the structure of a Bitcoin block and the concept of the Genesis Block.	CO1	PO1	7
	c)	Analyze the differences between Full Nodes and SPVs in the Bitcoin network	CO2	PO2	8
		OR			
8	a)	Define Bitcoin wallets and describe their types.	CO1	PO1	5
	b)	Illustrate the process of Bitcoin transactions, including consensus and mining.	CO1	PO1	7
	c)	Evaluate the advantages and limitations of Bitcoin scripts in secure transactions.	CO1	PO1	8
		UNIT - V			
9	a)	Define Ethereum and describe its design philosophy	CO1	PO1	5
	b)	Explain the structure of an Ethereum transaction and message.	CO1	PO1	7
	c)	Compare Ethereum's approach to smart contracts with Bitcoin's scripting system.	CO2	PO2	8
		OR			
10	a)	Discuss the Ethereum Virtual Machine (EVM) and its role in executing smart contracts.	CO1	PO1	5
	b)	Illustrate the concept of Gas in Ethereum and its impact on transaction costs.	CO1	PO1	7
	c)	Evaluate the Ethereum ecosystem components (Swarm, Whisper, DApp) and their interrelation.	CO3	PO1	8
