

U.S.N.

**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.

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

	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
		<b>OR</b>			
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
		<b>UNIT - IV</b>			
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
		<b>OR</b>			
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
		<b>UNIT - V</b>			
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
		<b>OR</b>			
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

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