U.S.N.										

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

Autonomous Institute Affiliated to VTU

June / July 2025 Semester End Main Examinations

Programme: B.E. **Semester: V**

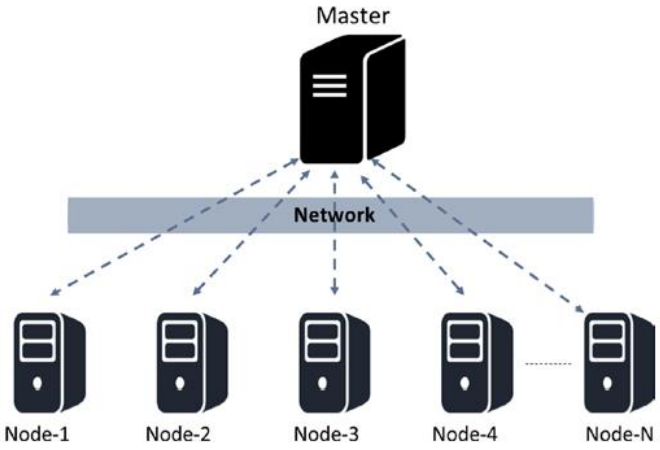
Branch: Information Science and Engineering **Duration: 3 hrs.**

Course Code: 23IS5PEBCT **Max Marks: 100**

Course: Blockchain Technology

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

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.

		UNIT - I	CO	PO	Marks
1	a)	Give the typical blockchain data structure. Assume there are three candidates Alice, Bob and Charlie who are doing some monetary transactions among each other on a blockchain network. Explain the step by step transactions to show blockchain's open and decentralized features.	CO1	PO1	10
	b)	Differentiate centralized and dececntralized system. Also identify the system given in Fig.1 and explain the same.  Fig.1	CO2	PO2	10
		OR			
2	a)	Why blockchain important? Also give the limitations of centralized systems.	CO1	PO1	10
	b)	Why application layer and semantic layer important in blockchain? Justify with reasons.	CO1	PO2	10

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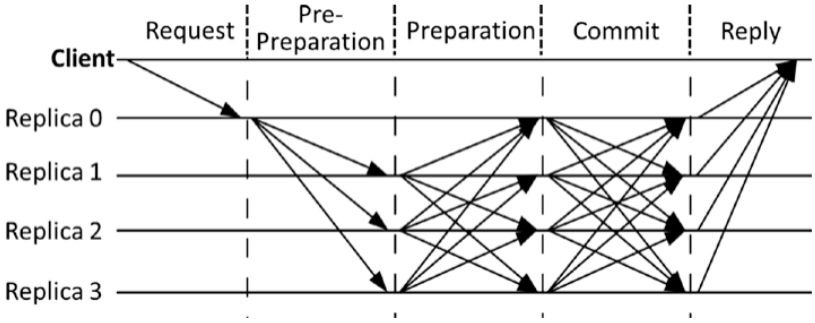
			UNIT - II			
	3	a)	Why cryptography is the most important component of blockchain? Also, explain its working in general.	*CO1*	*PO1*	**10**
		b)	How do you relate Keccak and SHA-3? Explain in detail about SHA-3.	*CO1*	*PO2*	**10**
			OR			
	4	a)	Explain the Merkle-Damgard construction for SHA-256 in detail with suitable diagram.	*CO2*	*PO1*	**10**
		b)	Illustrate Diffie Hellman Key exchange algorithm with suitable example. Give its usage.	*CO2*	*PO1*	**10**
			UNIT - III			
	5	a)	Why Game theory is important for blockchain? Also explain Nash equilibrium and Prisoner's Dilemma.	*CO2*	*PO1*	**10**
		b)	Define Merkle tree. How it is represented in blockchain? Explain the verification process of Merkle tree.	*CO2*	*PO1*	**10**
			OR			
	6	a)	List and explain the desired properties of blockchain. Give an example how blockchain overcomes double-spend resistant?	*CO2*	*PO1*	**10**
		b)	What does Fig.2 indicates. Explain the approach in detail.  **Fig. 2**	*CO2*	*PO2*	**10**
			UNIT - IV			
	7	a)	Why Bitcoin is required? Explain Bitcoin blockchain with suitable diagrams.	*CO2*	*PO1*	**10**
		b)	List the Bitcoin transactions, fields and give its description. Also, give the structure of granular components of a Bitcoin transactions.	*CO2*	*PO1*	**10**
			OR			
	8	a)	List the components that are required for block header of Bitcoin. Give its size and description.	*CO2*	*PO1*	**10**

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		b)	How Bitcoin blockchain network works on the Internet? Explain with its structure.	*CO2*	*PO1*	**10**
			UNIT - V			
	9	a)	With respect to Voting Applications, explain Ethereum smart contracts.	*CO3*	*PO1*	**10**
		b)	Illustrate Ethereum smart contracts deployment and usage.	*CO3*	*PO1*	**10**
			OR			
	10	a)	Give the design principles of Ethereum blockchain. Also, explain the different Merkle roots of Ethereum blockchain.	*CO3*	*PO2*	**10**
		b)	Justify "Transactions on Ethereum run on 'gas', the fundamental unit of computation in Ethereum".	*CO3*	*PO2*	**10**

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REAPPEAR EXAMS 2024-25