SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR
(AUTONOMOUS)

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QUESTION BANK

Subject with Code: Block Chain Technology (23CS1011) **Course & Branch: B. Tech - CIC**
Year & Sem : III-B. Tech & II-Sem **Regulation: R23**

		UNIT - I			
1	**(a)**	What is Blockchain?	**L2**	**CO1**	**2M**
	(b)	Define Distributed Ledger.	**L1**	**CO1**	**2M**
	(c)	What is Immutability in Blockchain?	**L2**	**CO1**	**2M**
	(d)	Describe a CyptoCurrency?	**L1**	**CO1**	**2M**
	(e)	Explain Consensus in Blockchain.	**L2**	**CO1**	**2M**
2	**(a)**	Explain the concept of blockchain as a distributed, immutable ledger.	**L2**	**CO1**	**5M**
	(b)	Compare the Block chain and a traditional centralized database in terms of trust, control, and failure modes.	**L4**	**CO1**	**5M**
3		Describe the historical evolution from early cryptographic primitives to the design of Bitcoin's blockchain by Satoshi Nakamoto.	**L1**	**CO1**	**10M**
4		With a neat sketch, describe the main components of a blockchain system and explain how they interact.	**L1**	**CO1**	**10M**
5	**(a)**	Draw and explain the internal structure of a block.	**L4**	**CO1**	**5M**
	(b)	Illustrate the roles of the block header, previous block hash, Merkle root, timestamp, and nonce.	**L4**	**CO1**	**5M**
6		Define decentralization and distribution in blockchain systems and analyze how they affect security, transparency, and performance.	**L1**	**CO1**	**10M**
7		Compare public, private, and consortium blockchains with respect to access control, transparency, consensus style, and typical application domains.	**L4**	**CO1**	**10M**
8	**(a)**	Explain Proof of Work and Proof of Stake consensus mechanisms.	**L2**	**CO1**	**5M**
	(b)	Discuss the advantages and disadvantages of each for large public networks.	**L2**	**CO1**	**5M**
9		Define coin, altcoin, and token, and illustrate the differences among them with suitable examples from existing cryptocurrencies.	**L1**	**CO1**	**10M**
10		Classify cryptocurrencies into payment coins, smart-contract platforms, stablecoins, utility tokens, and governance tokens, and explain few use case for each category.	**L2**	**CO1**	**10M**
11		Discuss the major challenges that hinder widespread adoption of cryptocurrencies and suggest possible mitigations.	**L2**	**CO1**	**10M**

		UNIT – II			
1	**(a)**	What is a Public Blockchain?	**L2**	**CO2**	**2M**
	(b)	Write two examples of public blockchains.	**L3**	**CO2**	**2M**
	(c)	Define UTXO model?	**L1**	**CO2**	**2M**
	(d)	What is a Smart Contract?	**L2**	**CO2**	**2M**
	(e)	What is an Oracle?	**L2**	**CO2**	**2M**
2	**(a)**	Define a public blockchain with their key properties.	**L1**	**CO2**	**5M**
	(b)	Why Bitcoin and Ethereum are considered public permission less networks?	**L4**	**CO2**	**5M**
3	**(a)**	Explain the UTXO model used in the Bitcoin blockchain.	**L2**	**CO2**	**5M**
	(b)	Differentiate the UTXO model and the account-based model adopted by Ethereum.	**L4**	**CO2**	**5M**
4		Discuss the main design goals of the Bitcoin blockchain and explain how its scripting capabilities constrain on-chain programmability.	**L1**	**CO2**	**10M**
5		Describe the Ethereum Virtual Machine (EVM) and explain its role in executing smart contracts and maintaining global state consistency.	**L1**	**CO2**	**10M**
6		Compare the Bitcoin and Ethereum blockchains in terms of objectives, consensus, data model, programmability, and typical applications.	**L4**	**CO2**	**10M**
7		Define a smart contract and describe its key characteristics.	**L1**	**CO2**	**10M**
8		Classify smart contracts based on their application domains and describe one detailed example from any one domain.	**L4**	**CO2**	**10M**
9	**(a)**	What are oracles in the context of smart contracts?	**L2**	**CO2**	**5M**
	(b)	Explain different types of oracles and why they are needed.	**L2**	**CO2**	**5M**
10		Explain the life cycle of an Ethereum smart contract from writing and compiling the code to deployment, invocation, and eventual upgrade or decommission.	**L2**	**CO2**	**10M**
11		Discuss how smart contracts are used in industry for automation, outlining both benefits and practical challenges.	**L1**	**CO2**	**10M**

		UNIT - III			
1	**(a)**	What is a Consortium Blockchain?	**L2**	**CO3**	**2M**
	(b)	What is a Private Blockchain?	**L2**	**CO3**	**2M**
	(c)	Define Byzantine Fault Tolerance (BFT).	**L1**	**CO3**	**2M**
	(d)	Explain about ICO?	**L2**	**CO4**	**2M**
	(e)	Write four enterprise blockchain platforms.	**L3**	**CO4**	**2M**
2		Define a private blockchain and describe its key characteristics.	**L1**	**CO3**	**10M**
3		Explain with an example how a private blockchain can be applied to an e-commerce site for recording orders, payments, and shipment events among multiple parties.	**L2**	**CO3**	**10M**
4		Describe the concept of a replicated state machine in the context of permissioned blockchains and explain how transactions drive state transitions.	**L2**	**CO3**	**10M**
5	**(a)**	Discuss the need for Byzantine Fault Tolerant algorithms in permissioned blockchains.	**L2**	**CO3**	**5M**
	(b)	Briefly explain how BFT consensus differs from simple crash-fault tolerance.	**L2**	**CO3**	**5M**
6		Write detailed notes on Multichain as a permissioned blockchain platform, focusing on its origin, configuration options, and typical use cases.	**L3**	**CO3**	**10M**
7		Define a consortium blockchain and discuss why organizations may prefer it over both fully public and fully private blockchains.	**L1**	**CO4**	**10M**
8		Elaborate Hyperledger Fabric, Ripple, and Corda as enterprise/consortium platforms in terms of design goals, consensus style, and data-sharing model.	**L3**	**CO4**	**10M**
9	**(a)**	Describe an Initial Coin Offering (ICO).	**L2**	**CO4**	**5M**
	(b)	Explain how ICO differs from traditional fundraising mechanisms like IPOs or venture capital.	**L2**	**CO4**	**5M**
10		Outline the typical process of launching an ICO and the main factors that a rational investor should examine before investing.	**L4**	**CO4**	**10M**
11		Discuss the pros and cons of ICOs, referring to issues such as global accessibility, regulatory risk, fraud, speculation, and the subsequent evolution toward STOs and IEOs.	**L2**	**CO4**	**10M**

		UNIT - IV			
1	**(a)**	What is Double Spending?	**L2**	**CO5**	**2M**
	(b)	Define Scalability in Blockchain?	**L1**	**CO5**	**2M**
	(c)	Explain Pseudonymity in Blockchain.	**L2**	**CO5**	**2M**
	(d)	Describe about KYC.	**L2**	**CO5**	**2M**
	(e)	What is a 51% Attack?	**L2**	**CO5**	**2M**
2		Explain how cryptography and consensus mechanisms together provide security and integrity for blockchain ledgers.	**L2**	**CO5**	**10M**
3	**(a)**	Describe the double-spending problem in digital currencies	**L1**	**CO5**	**5M**
	(b)	Explain how the Bitcoin blockchain mitigates double-spending issue in a decentralized manner.	**L2**	**CO5**	**5M**
4		Discuss the main security and privacy challenges of public blockchains, specifically linkability of transactions, key management, and common attack vectors on users and nodes.	**L2**	**CO5**	**10M**
5	**(a)**	Analyze the performance and scalability limitations of blockchains.	**L4**	**CO5**	**5M**
	(b)	Briefly discuss about techniques proposed to improve throughput and latency.	**L4**	**CO5**	**5M**
6	**(a)**	Explain the role of identity management and authentication in blockchain systems	**L2**	**CO5**	**5M**
	(b)	Compare real-world identity binding with pseudonymous addresses.	**L4**	**CO5**	**5M**
7		Discuss how regulatory compliance affects the design and deployment of blockchain solutions.	**L2**	**CO5**	**10M**
8		Identify typical vulnerabilities in blockchain smart contracts or DApps and suggest best practices to safeguard them.	**L4**	**CO5**	**10M**
9		Describe how Hyperledger Fabric addresses security and privacy requirements through its membership, channel, and endorsement mechanisms.	**L1**	**CO5**	**10M**
10		Explain with examples how blockchain can be used in the following sectors: banking & finance, education, energy, healthcare, real-estate, supply chain, or IoT.	**L2**	**CO5**	**10M**
11		Elaborate the key limitations and challenges of blockchain technology for long-term adoption.	**L2**	**CO5**	**10M**

		UNIT - V			
1	**(a)**	Write details about Chaincode?	**L3**	**CO6**	**2M**
	(b)	What is a Peer in Fabric?	**L2**	**CO6**	**2M**
	(c)	Write any four applications of blockchain.	**L3**	**CO6**	**2M**
	(d)	What is a Channel in blockchain?	**L2**	**CO6**	**2M**
	(e)	Describe about DApp?	**L1**	**CO6**	**2M**
2		Design a brief case study for a retail organization using blockchain to improve product provenance and loyalty management, explaining the benefits over traditional systems.	**L5**	**CO6**	**10M**
3		Explain a banking or financial-services use case of blockchain, such as cross-border payments or syndicated lending, focusing on how shared ledgers reduce reconciliation effort.	**L2**	**CO6**	**10M**
4		Describe a healthcare-oriented blockchain solution for managing electronic health records and discuss how it balances data sharing with privacy requirements.	**L1**	**CO6**	**10M**
5		Discuss a blockchain-based application in the energy and utilities sector (such as peer-to-peer energy trading or carbon credit markets) and outline its advantages and constraints.	**L2**	**CO6**	**10M**
6		Explain the basic steps for building a simple blockchain prototype in Python, covering block structure, hashing, chain validation, and a minimal networking or API layer.	**L2**	**CO6**	**10M**
7		List common Python libraries and tools that can be used when developing blockchain applications and explain their roles.	**L1**	**CO6**	**10M**
8		Describe the main components of a Hyperledger Fabric network and explain how they interact.	**L1**	**CO6**	**10M**
9		Explain what chaincode is in Hyperledger Fabric and outline how sample chaincodes from educational or vendor resources can be used as templates for applications.	**L2**	**CO6**	**10M**
10		Discuss the purpose of the Fabric Java SDK in building blockchain applications and outline the basic steps a Java client follows to submit a transaction.	**L2**	**CO6**	**10M**
11		Compare the requirements and design considerations when implementing a blockchain application in Python (for a public chain like Ethereum) versus implementing one on Hyperledger Fabric in an enterprise setting.	**L5**	**CO6**	**10M**

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