

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY: PUTTUR
(AUTONOMOUS)**



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QUESTION BANK (DESCRIPTIVE)

Subject with Code: BLOCKCHAIN FOR AI(23CS0925)

Branches: B.Tech - CSM & CAI

Year & Sem: III-B. Tech & II-Semester

Regulation: R23

UNIT-I

BLOCKCHAIN FUNDAMENTALS AND ARCHITECTURE

1	a	Define Blockchain Technology.	[L1][CO1]	[2M]
	b	State and define the components of Blockchain.	[L1][CO1]	[2M]
	c	What is the function of "mining" and how is it categorised?	[L1][CO1]	[2M]
	d	List few advantages and disadvantages of Blockchain.	[L1][CO1]	[2M]
	e	How does a public blockchain differ from a private blockchain?	[L1][CO1]	[2M]
2		Illustrate how blockchain technology works with the help of an example.	[L3][CO1]	[10M]
3	a	Describe block in Blockchain and explain it's structure with neat diagram.	[L2][CO1]	[5M]
	b	Discuss in detail about Merkle tree with diagram.	[L2][CO1]	[5M]
4		Analyze the different types of Blockchains with their advantages and disadvantages.	[L4][CO1]	[10M]
5	a	What is a Cryptographic Hash? Explain with an example.	[L2][CO1]	[5M]
	b	Explain the different types of Distributed Ledger Technology	[L2][CO1]	[5 M]
6	a	Explain the use case of DLT illustrating how a Blockchain Validates and Adds a Transaction.	[L2][CO1]	[5M]
	b	Analyze in detail how is Blockchain different from Distributed Ledger.	[L4][CO1]	[5M]
7		Discuss the role of Peer to Peer Networks in Blockchain and its different types P2P as well as its benefits and drawbacks.	[L2][CO1]	[10M]
8	a	List and explain the advantages and disadvantages of Distributed Ledger Technology in Blockchain.	[L2][CO1]	[5M]
	b	Describe the Blockchain structure with a neat diagram.	[L2][CO1]	[5M]
9		What is mining? Describe the process of mining in detail and its different types.	[L2][CO1]	[10M]
10		Explain the evolution of blockchain technology and discuss its major use cases across different domains	[L2][CO1]	[10M]
11		Analyze the different phases in the Evolution of Blockchain and those features.	[L4][CO1]	[10M]

UNIT-II

SMART CONTRACTS AND CONSENSUS MECHANISMS

1	a	What is consensus mechanisms? Define it's types.	[L1][CO2]	[2M]
	b	Describe Ether and Gwei.	[L1][CO2]	[2M]
	c	Calculate the total fee paid by Shubham and determine how much ETH is credited to Rahul, how much is received by the miner as a tip, and how much base fee is burned, if the gas limit is 21,000 units, the base fee is 100 gwei, and the tip is 10 gwei?	[L3][CO2]	[2M]
	d	Define Event in Ethereum and state how it works.	[L1][CO2]	[2M]
	e	List the types of Chaincode in Hyperledger Fabric.	[L1][CO2]	[2M]
2	a	State and explain the key features of smart contracts.	[L2][CO2]	[5M]
	b	List and explain the types of Smart Contract along with it's capabilities.	[L2][CO2]	[5 M]
3		Define Smart Contract. Illustrate the how it works with an example.	[L3][CO2]	[10M]
4	a	Explain the advantages and disadvantages of the smart contract.	[L2][CO2]	[5 M]
	b	Discuss the applications of smart contracts with example.	[L2][CO2]	[5 M]
5		What is Ethereum? Discuss the core and supporting components of Ethereum network.	[L2][CO2]	[10M]
6	a	Illustrate how Ethereum work with neat diagram.	[L3][CO2]	[5 M]
	b	Discuss the advantgage and disadvantages of Ethereum	[L2][CO2]	[5 M]
7	a	What is Solidity? Explain it features.	[L2][CO2]	[5 M]
	b	Write and explain a Solidity program to store a number in a state variable and retrieve it using set and get functions.	[L6][CO2]	[5M]
8		State and Analyze the different types of consensus algorithms based on their working principles, advantages and disadvantages.	[L4][CO2]	[10M]
9	a	Define Gas in Ethereum. List and describe the different types of fee included in Gas Fees.	[L2][CO2]	[5M]
	b	Discuss on Transaction types, architecture and its life cycle with diagram in ethereum.	[L2][CO2]	[5M]
10		Explain Hyperledger Fabric Architecture and compare chaincode with smart contracts	[L2][CO2]	[10M]
11	a	Illustrate step by step procedure to install ChainCode in block chain network.	[L3][CO2]	[5M]
	b	Explain the step by step procedure of the deployment and testing of smart contract in detail.	[L2][CO2]	[5M]

UNIT III

INTEGRATION OF BLACKCHAIN AND AI

1	a	List the main benefits of integrating blockchain with AI.	[L1][CO3]	[2M]
	b	How does blockchain improve the reliability of AI models?	[L1][CO3]	[2M]
	c	What is Homomorphic Encryption algorithm?	[L1][CO3]	[2M]
	d	How can Blockchain add on to AI?	[L2][CO3]	[2M]
	e	Analyze the difference between federated learning and machine learning.	[L4][CO3]	[2M]
2	a	List and explain the motivations for integrating blockchain with AI. Also state some example to justify.	[L2][CO3]	[5M]
	b	Explain how decentralized AI works.	[L2][CO3]	[5M]
3	a	State what is Federated Learning and Compare different types of federated learnings.	[L4][CO3]	[5 M]
	b	Discuss any five Federated learning frameworks in detail.	[L4][CO3]	[5M]
4		Explain the Federated Learning system, its components and working process, and discuss its benefits and challenges.	[L2][CO3]	[10M]
5		Why Blockchain is Used for Secure AI Model Sharing? Illustrate secure data exchange process in Blockchain.	[L3][CO3]	[10M]
6	a	Compare On-Chain and Off-Chain storage in Blockchain.	[L4][CO3]	[5M]
	b	Describe what is provenance in blockchain for AI, what types of information are recorded and how are they used, and what are its advantages and disadvantages.	[L2][CO3]	[5M]
7	a	Describe how can successful achievement of AI provenance be ensured, and how can it be effectively implemented using blockchain technology.	[L2][CO3]	[5M]
	b	Discuss about data integrity in blockchain-based AI systems, and what techniques are used to ensure data integrity in such systems.	[L2][CO4]	[5M]
8		Analyze the different types of Data Integrity Mechanisms in Blockchain-Based AI Systems.	[L4][CO4]	[10M]
9	a	Discuss security and design considerations for ensuring data integrity in blockchain-based AI systems.	[L2][CO4]	[5M]
	b	Explain AI for Blockchain and its role in optimizing consensus, scalability, security, and smart contracts.	[L2][CO4]	[5M]
10		Explain decentralized AI marketplaces, including their architecture, workflow, roles of AI and blockchain, benefits, and challenges.	[L2][CO4]	[10M]
11		Discuss SingularityNET, Ocean Protocol, and Fetch.ai as examples of decentralized AI marketplaces, highlighting their working, features, and use cases.	[L2][CO4]	[10M]

UNIT IV

APPLICATIONS OF BLOCKCHAIN IN AI SYSTEMS

1	a	What is explainable AI?	[L1][CO5]	[2M]
	b	List the Pillars of Trusted AI.	[L1][CO5]	[2M]
	c	Discuss Anomaly detection in Trusted AI.	[L1][CO5]	[2M]
	d	What is Non Fungible Tokens?	[L1][CO5]	[2M]
	e	Describe Zero knowledge proof with example.	[L2][CO5]	[2M]
2	a	Explain Blockchain for XAI and trusted AI along with their features.	[L2][CO5]	[5M]
	b	Illustrate step by step process to achieve Blockchain Integrated XAI.	[L3][CO5]	[5M]
3		Illustrate the integration process of application of AI&BC in healthcare and genomics domain along with the smart contract logic implementation.	[L3][CO5]	[10M]
4	a	Explain the role of Blockchain in Autonomous Vehicles.	[L2][CO5]	[5M]
	b	Discuss the Role of Blockchain in IOT systems.	[L2][CO5]	[5M]
5		Analyze the Traditional AV/IoT vs Blockchain-Enabled AV/IoT in detail.	[L4][CO5]	[10M]
6		Explain in detail Financial AI systems with smart contracts describing a real time scenario.	[L2][CO5]	[10M]
7	a	Explain the key applications of Blockchain in finance AI system	[L2][CO5]	[5M]
	b	Explain the implementation of Automated fraud detection and response	[L2][CO5]	[5M]
8	a	Explain how AI Governed Investment fund app works	[L2][CO5]	[5M]
	b	Compare Traditional Financial AI & Block chain integrated Financial AI	[L4][CO5]	[5M]
9		Discuss supply chain and logistics Intelligence and explain how it uses integrated AI and Blockchain	[L2][CO5]	[10M]
10	a	What is NFT? Explain its characteristics, representation, working process, and advantages.	[L2][CO5]	[5M]
	b	Create a NFT-based smart contract as a solution to identity problem and explain its working.	[L6][CO5]	[5M]
11	a	Explain Intellectual Property protection using NFT with smart contract algorithm.	[L2][CO5]	[5M]
	b	Explain how to prevent Deepfake video using NFT with smart contract algorithm.	[L2][CO5]	[5M]

UNIT V

SECURITY, PRIVACY AND CHALLENGES IN BLOCKCHAIN AI

1	a	What security benefit does blockchain provide to AI systems?	[L1][CO6]	[2M]
	b	How does blockchain support privacy preservation in AI applications?	[L1][CO6]	[2M]
	c	List the major challenge in integrating blockchain with AI.	[L1][CO6]	[2M]
	d	Why is data quality a concern when using blockchain for AI?	[L1][CO6]	[2M]
	e	What is Sybil attack? Define it's types.	[L1][CO6]	[2M]
2	a	Why is security essential in blockchain systems? List and explain the major types of blockchain attacks.	[L2][CO6]	[5 M]
	b	Discuss the best practices for building secure Blockchain solutions.	[L2][CO6]	[5 M]
3	a	Explain the Blockchain security for the enterprises along with its challenges and examples.	[L2][CO6]	[5 M]
	b	Describe the evolution and working of Sybil attacks.	[L1][CO6]	[5M]
4	a	Explain Proof of Work and its role in preventing Sybil attacks, with reference to the Twitter 2022 bot attack case.	[L1][CO6]	[5M]
	b	What Is A 51% Attack? Discuss how does A 51% Attack Work.	[L1][CO6]	[5M]
5	a	Explain 51% attack and how is it prevented.	[L2][CO6]	[5M]
	b	Discuss data privacy, its importance, regulatory challenges in blockchain, and future trends in privacy management.	[L2][CO6]	[5M]
6	a	Compare public and private blockchain privacy systems, discussing their features, advantages, and reasons for use.	[L4][CO6]	[5M]
	b	Discuss blockchain security use cases, implementation challenges, privacy issues, and few major privacy failures.	[L2][CO6]	[5M]
7		Explain in detail about zero knowledge proofs, it's types, properties and how are they used in blockchain with an example.	[L2][CO6]	[10M]
8	a	Explain the Bitcoin scalability problem and discuss layer-based solutions currently available.	[L2][CO6]	[5M]
	b	Can Bitcoin truly be scalable, and is the increasing length of the Bitcoin blockchain really a problem? Justify your answer.	[L6][CO6]	[5M]
9	a	Analyze the energy efficiency of PoS vs PoW	[L4][CO6]	[5M]
	b	Describe Sustainable Blockchain along with the challenges and practices to achieve it.	[L2][CO6]	[5M]
10	a	Discuss any 5 Ethical and Legal concerns in AI with Blockchain.	[L2][CO6]	[5M]
	b	Explain blockchain interoperability with its working and available solutions to achieve it.	[L2][CO6]	[5M]
11		Explain the concept of a Quantum-Resistant Blockchain. Discuss why it is needed and the key techniques used to achieve quantum resistance in detail.	[L2][CO6]	[10M]