Seat No		Question Paper Code	WU24VII-422

WALCHAND INSTITUTE OF TECHNOLOGY, SOLAPUR

An Autonomous Institute affiliated to PAH Solapur University, Solapur

Information Technology
Final Year B. Tech. Sem-VII 2024-25 (CBCS pattern)
End Semester Examination

Course: Professional Elective-II- Blockchain Technology **Max. Marks:** 60 **SET:** R
Course Code: 21ITU7EN33T

Day and Date: Friday 29/11/2024 **Time:** 02.30 pm to 05.30 pm

Instructions:
1. All questions are compulsory.
2. Assume suitable data wherever necessary.
3. Draw neat sketches wherever necessary.
4. Q.1 should be solved in first 30 minutes and answers should be written only on the first page of answer book.
5. Supplements will not be provided.
6. Use of nonprogrammable calculator is permitted.

Q. No	Sub Que		Marks
1		**Multiple Choice Questions**	12
	i.	What is the main purpose of Proof of Storage in blockchain technology? a. To verify transaction validity b. To use available storage as a consensus mechanism c. To replace Proof of Stake d. To decrease transaction costs	
	ii.	Which of the following mechanisms requires participants to "burn" a portion of their cryptocurrency to validate blocks? a. Proof of Stake b. Proof of Activity c. Proof of Deposit d. Proof of Burn	
	iii.	Which of the following is a significant limitation of Bitcoin as a currency? a. Lack of privacy features b. Limited scalability c. Complex transaction fees d. Limited international acceptance	
	iv.	What is the primary purpose of a Merkle tree in blockchain? a. To increase the number of transactions in each block b. To verify transactions efficiently by using hash pointers c. To store user identity information d. To create digital signatures	

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	v.	What is the purpose of Bitcoin scripts in transactions? a. To enable multi-signature transactions and other conditions for spending bitcoins b. To encrypt all transaction data c. To allow mining without computational work d. To store user information on the blockchain	
	vi.	In Ethereum, smart contracts are primarily written and executed using which programming language? a. Python b. Solidity c. Java d. Rust	
	vii.	Which of the following best defines a blockchain? a. A centralized database with limited access b. A distributed ledger that records transactions across many computers c. A digital currency used for online payments d. A collection of documents stored on a single server	
	viii.	Which of the following is NOT a common application of blockchain? a. Supply chain management b. Digital voting systems c. Cloud-based document storage d. Cryptocurrencies	
	ix.	Which type of blockchain is used when multiple organizations jointly control and operate the network? a. Public blockchain b. Private blockchain c. Consortium blockchain d. Hybrid blockchain	
	x.	What does decentralization in blockchain refer to? a. The absence of any security measures b. The removal of central control, with data distributed across multiple nodes c. The ability to reverse transactions if needed d. The use of single points of failure to increase efficiency	
	xi.	What is the primary purpose of a digital signature in blockchain transactions? a. To encrypt transaction data b. To verify the identity of the sender and ensure transaction integrity c. To increase transaction speed d. To mine new cryptocurrency	
	xii.	Which of the following is a property of a cryptographic hash function? a. It produces a different output each time for the same input b. It is reversible c. It produces a fixed-size output d. It requires a public and private key pair	

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Q. No	Sub Que		Marks
Q.2		**Attempt any *Four***	12
	i.	What is blockchain, and how does it function as a distributed ledger?	
	ii.	What is the difference between a public blockchain and a private blockchain?	
	iii.	Identify and explain the primary types of blockchain: public, private, and consortium?	
	iv.	How does a distributed system contribute to the reliability of blockchain networks?	
	v.	Discuss the key properties of P2P systems and how they differ from client-server architectures?	
Q.3		**Attempt any *Two***	12
	i.	Demonstrate how hash pointers are used in blockchain to create a chain of blocks. Why are they important in ensuring data integrity?	
	ii.	Describe how digital signatures work to ensure transaction authenticity in blockchain systems. Illustrate with an example?	
	iii.	Illustrate the process of storing and using bitcoins in a Bitcoin wallet. How would you secure these stored bitcoins against unauthorized access?	

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Q.4		**Attempt any *Four***	12
	i.	Explain how Proof of Storage works and describe one scenario where it is useful?	
	ii.	What are some limitations of Bitcoin in terms of scalability and transaction speed, and how do they affect its usability as a currency?	
	iii.	Describe the purpose of smart contracts. How do they differ from traditional contracts?	
	iv.	Compare Bitcoin's architecture with Ethereum's stack. How does each support different use cases?	
	v.	Describe the consensus mechanism used in Ethereum. How does it ensure that transactions on the network are valid and secure?	
Q.5		**Attempt any *Two***	12
	i.	How would you implement a consortium blockchain for a financial organization? Describe the roles and benefits of using a consortium in this context?	
	ii.	Describe how blockchain could be used to streamline data management in large industries, such as manufacturing or logistics?	
	iii.	Illustrate the steps for developing and deploying a distributed application (DApp) using Hyperledger for a specific industry, such as finance or healthcare?	