

AS PER AP-CBCS SYLLABUS 2023-2024

COMPUTER APPLICATIONS(MAJOR/MINOR)

3RD YEAR – SEMESTER - V

BLOCK CHAIN TECHNOLOGY

(Common to All Universities in AP)

UNIT I: LAYERS OF A SOFTWARE SYSTEM

Layers of a Software System, Integrity, A Payment System, Types of Software Architecture, Purpose of the Blockchain, Peer-to-Peer system: Definition, Architecture, Link between Peer-to-Peer and Blockchain, Integrity Threats in Peer-to-Peer Systems, Four ways of Defining Blockchain, The purpose of the Blockchain, Blockchain Properties

Case Study: Identify Different Crypto Payments and Differentiate Them

UNIT – II: FOUNDATIONS OF OWNERSHIP

Foundations of Ownership, Security Related concepts in Block chain, Purpose and Properties of a Ledger, Double Spending Problem, Designing and Developing a Software System, Documenting Ownership, Integrity of the Transaction History

Case Study: Study about Harbor, Ubitquity, Propy that are used in Real Estate

UNIT-III: HASH FUNCTION IN BLOCK CHAIN

Hash Function in Block chain, Patterns of Hashing Data, Uses of Hash Values, Cryptography: Activities, Types of Cryptography, Digital Signatures

Case Study: Differentiate between various Blockchain Techniques used in Medical Field such as Ambrosus, Connecting Care, Farma Trust, MedRec

UNIT-IV: TRANSFORMING BOOK INTO BLOCKCHAIN DATA STRUCTURE

Transforming Book into Blockchain Data structure, Chaining Blocks of Data, Protecting the Data Store, Distributing the Data Store among Peers, Verifying and Adding Transactions

Case Study: How we Apply Blockchain Technology in Elections and Voting

UNIT-V: CHOOSING A TRANSACTION HISTORY

Choosing a transaction History, Paying for Integrity, Technical Limitations of Blockchain, Conflicting Goals of the Blockchain, Characteristics of the Blockchain, Blockchain Applications, Blockchain Platforms

Case Study: Identify various Blockchain Technologies used in Entertainment



IMPORTANT QUESTIONS

LEVEL – 1

UNIT-I: LAYERS OF A SOFTWARE SYSTEM

- ❖ Define the layers of a software system and explain the responsibilities of each layer. 1
- ❖ Discuss the concept of data integrity in software systems and its importance in ensuring reliable operations. 4
- ❖ Describe the architecture of a payment system, highlighting the components involved and their interactions. 6
- ❖ Explain various types of software architecture patterns, such as Layered, Client-Server, Microservices, and Event-Driven architectures, and their respective use cases. 8
- ❖ Define blockchain technology and discuss its primary purpose in modern digital systems. 10
- ❖ Analyze the relationship between Peer-to-Peer systems and blockchain technology, focusing on their shared characteristics and differences. 14
- ❖ Identify and explain common integrity threats in Peer-to-Peer systems and propose mitigation strategies. 17

UNIT-II: FOUNDATIONS OF OWNERSHIP

- ❖ Discuss the key security concepts in blockchain technology, including decentralization, cryptography, and consensus mechanisms, and how they contribute to the overall security of the system. 47
- ❖ Explain the purpose and essential properties of a ledger in

- blockchain systems, highlighting its role in ensuring transparency and immutability.49
- ❖ Describe the double-spending problem in digital currencies and analyze how blockchain technology addresses and prevents this issue.51
 - ❖ Outline the steps involved in designing and developing a blockchain-based software system, including considerations for architecture, consensus mechanisms, and integration.53
 - ❖ Examine the methods by which blockchain technology documents and verifies ownership, and discuss its applications in various industries.55
 - ❖ Analyze how blockchain ensures the integrity of transaction history, focusing on features like immutability, transparency, and traceability.57
 - ❖ Study about Harbor, Ubitquity, Propy that are used in Real Estate59

UNIT-III: HASH FUNCTION IN BLOCK CHAIN

- ❖ Explain various patterns of hashing data in blockchain systems, such as independent hashing, repeated hashing, combined hashing, sequential hashing, and hierarchical hashing. Provide examples to illustrate each pattern.72
- ❖ Discuss the uses of hash values in blockchain applications. How do hash values contribute to the immutability and verification processes in blockchain?75
- ❖ Define cryptography and elaborate on its significance in blockchain technology. Discuss the primary activities involved in cryptography within blockchain systems.77
- ❖ Compare and contrast symmetric-key and asymmetric-key cryptography. How are these cryptographic methods

utilized in blockchain networks?	80
❖ Describe digital signatures and their function in blockchain transactions. How do digital signatures ensure authenticity and non-repudiation in blockchain systems?	83
❖ Discuss the role of Merkle trees in blockchain systems. How do they utilize hash functions to efficiently verify data integrity?	92
❖ Evaluate the challenges and considerations in selecting appropriate hash functions for blockchain applications, including factors like security, performance, and resistance to attacks.	94

UNIT-IV: TRANSFORMING BOOK INTO BLOCKCHAIN DATA STRUCTURE

❖ Explain the concept of transforming a traditional book into a blockchain data structure.	108
❖ Discuss the process of chaining blocks of data in a blockchain and its significance.	111
❖ Describe how data is protected within the blockchain data store.	113
❖ Explain the method of distributing the blockchain data store among peers.	116
❖ Analyze the process of verifying transactions and adding them to the blockchain.	118
❖ Explain the role of cryptographic hash functions in securing blockchain data.	126
❖ Evaluate the impact of blockchain on transparency and trust in digital transactions.	129
❖ Describe the steps involved in creating and validating a new block in the blockchain network.	131

UNIT-V: CHOOSING A TRANSACTION HISTORY

- ❖ Explain the process of choosing a transaction history in the blockchain system. 145
- ❖ Discuss the concept of paying for integrity in blockchain and its implications. 147
- ❖ Analyze the technical limitations of blockchain technology. 150
- ❖ Describe the conflicting goals associated with blockchain development and usage. 152
- ❖ Explain the key characteristics of blockchain technology. 154
- ❖ Evaluate the various applications of blockchain across different industries. 155
- ❖ Analyze the trade-offs between security, decentralization, and performance in blockchain networks. 164

LEVEL - 2

- ❖ Describe the architecture of a Peer-to-Peer (P2P) system and explain how it differs from traditional client-server models. 12
- ❖ Discuss the four primary types of blockchain: Public, Private, Consortium, and Hybrid, including their features and applications. 20
- ❖ Enumerate and explain the key properties of blockchain technology that contribute to its security and reliability. 23
- ❖ Identify Different Crypto Payments and Differentiate Them 25
- ❖ Define the concept of ownership in digital systems and explain how blockchain technology establishes and verifies digital ownership. 44
- ❖ Define a hash function in the context of blockchain

technology. Discuss its role in ensuring data integrity and security within the blockchain.	69
❖ Analyze the interplay between hash functions and digital signatures in maintaining the security and integrity of blockchain transactions.	86
❖ Explain the concept of collision resistance in cryptographic hash functions and its importance in blockchain technology.	90
Case Study:	
❖ Differentiate between various Blockchain Techniques used in Medical Field such as Ambrosus, Connecting Care, Farma Trust, MedRec	97
❖ Discuss the importance of consensus mechanisms in maintaining blockchain integrity.	121
❖ Compare and contrast centralized and decentralized data storage systems	123
Case Study:	
❖ How we Apply Blockchain Technology in Elections and Voting	134
❖ Discuss the features and uses of popular blockchain platforms.	157
❖ Compare public and private blockchain platforms with suitable examples.	160
❖ Examine the challenges in achieving scalability and speed in blockchain systems.	161
❖ Identify various Blockchain Technologies used in Entertainment	166



List of Questions

UNIT-I: LAYERS OF A SOFTWARE SYSTEM

LONG ANSWER QUESTIONS

1. Define the layers of a software system and explain the responsibilities of each layer.1
2. Discuss the concept of data integrity in software systems and its importance in ensuring reliable operations.4
3. Describe the architecture of a payment system, highlighting the components involved and their interactions.6
4. Explain various types of software architecture patterns, such as Layered, Client-Server, Microservices, and Event-Driven architectures, and their respective use cases.8
5. Define blockchain technology and discuss its primary purpose in modern digital systems.10
6. Describe the architecture of a Peer-to-Peer (P2P) system and explain how it differs from traditional client-server models.12
7. Analyze the relationship between Peer-to-Peer systems and blockchain technology, focusing on their shared characteristics and differences.14
8. Identify and explain common integrity threats in Peer-to-Peer systems and propose mitigation strategies.17
9. Discuss the four primary types of blockchain: Public, Private, Consortium, and Hybrid, including their features and applications.20

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|--|---------|
| 10. Enumerate and explain the key properties of blockchain technology that contribute to its security and reliability. |23 |
| 11. Identify Different Crypto Payments and Differentiate Them |25 |

SHORT ANSWER QUESTIONS

- | | |
|--|---------|
| 12. Presentation Layer |27 |
| 13. Application Layer |28 |
| 14. Business Logic Layer |29 |
| 15. Data Access Layer |29 |
| 16. Database Layer |30 |
| 17. Data Integrity |31 |
| 18. Payment System Architecture |32 |
| 19. Layered Architecture Pattern |32 |
| 20. Client-Server Architecture Pattern |33 |
| 21. Microservices Architecture Pattern |34 |
| 22. Event-Driven Architecture Pattern |35 |
| 23. Blockchain Definition |36 |
| 24. Purpose of Blockchain |37 |
| 25. Peer-to-Peer System |37 |
| 26. P2P vs. Client-Server |38 |
| 27. Integrity Threats in P2P Systems |39 |
| 28. Public Blockchain |39 |
| 29. Private Blockchain |40 |
| 30. Consortium Blockchain |41 |
| 31. Hybrid Blockchain |42 |
| 32. Blockchain Properties |43 |

UNIT-II: FOUNDATIONS OF OWNERSHIP**LONG ANSWER QUESTIONS**

1. Define the concept of ownership in digital systems and explain how blockchain technology establishes and verifies digital ownership.44
2. Discuss the key security concepts in blockchain technology, including decentralization, cryptography, and consensus mechanisms, and how they contribute to the overall security of the system.47
3. Explain the purpose and essential properties of a ledger in blockchain systems, highlighting its role in ensuring transparency and immutability.49
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6. Examine the methods by which blockchain technology documents and verifies ownership, and discuss its applications in various industries.55
7. Analyze how blockchain ensures the integrity of transaction history, focusing on features like immutability, transparency, and traceability.57
8. Study about Harbor, Ubitquity, Propy that are used in Real Estate59

SHORT ANSWER QUESTIONS

9. Foundations of Ownership in Digital Systems	.....62
10. Security Concepts in Blockchain	.....62
11. Purpose of a Ledger in Blockchain	.....63
12. Properties of a Blockchain Ledger	.....64
13. Double-Spending Problem	.....64
14. Blockchain Solutions to Double-Spending	.....65
15. Designing Blockchain Software Systems	.....65
16. Developing Blockchain Applications	.....66
17. Documenting Ownership with Blockchain	.....67
18. Integrity of Transaction History in Blockchain	.....67

UNIT-III: HASH FUNCTION IN BLOCK CHAIN

LONG ANSWER QUESTIONS

1. Define a hash function in the context of blockchain technology. Discuss its role in ensuring data integrity and security within the blockchain.69
2. Explain various patterns of hashing data in blockchain systems, such as independent hashing, repeated hashing, combined hashing, sequential hashing, and hierarchical hashing. Provide examples to illustrate each pattern.72
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8. Explain the concept of collision resistance in cryptographic hash functions and its importance in blockchain technology.90
9. Discuss the role of Merkle trees in blockchain systems. How do they utilize hash functions to efficiently verify data integrity?92
10. Evaluate the challenges and considerations in selecting appropriate hash functions for blockchain applications, including factors like security, performance, and resistance to attacks.94

Case Study:

11. Differentiate between various Blockchain Techniques used in Medical Field such as Ambrosus, Connecting Care, Farma Trust, MedRec97

SHORT ANSWER QUESTIONS

12. Hash Function100
13. Independent Hashing100
14. Repeated Hashing101
15. Combined Hashing102
16. Sequential Hashing102
17. Hierarchical Hashing103
18. Uses of Hash Values103
19. Cryptography104
20. Symmetric-Key Cryptography105
21. Asymmetric-Key Cryptography105
22. Digital Signatures106
23. Data Integrity in Blockchain106
24. Authentication in Blockchain107

UNIT-IV: TRANSFORMING BOOK INTO BLOCKCHAIN DATA STRUCTURE

LONG ANSWER QUESTIONS

1. Explain the concept of transforming a traditional book into a blockchain data structure.108
2. Discuss the process of chaining blocks of data in a blockchain and its significance.111

3. Describe how data is protected within the blockchain data store.113
4. Explain the method of distributing the blockchain data store among peers.116
5. Analyze the process of verifying transactions and adding them to the blockchain.118
6. Discuss the importance of consensus mechanisms in maintaining blockchain integrity.121
7. Compare and contrast centralized and decentralized data storage systems123
8. Explain the role of cryptographic hash functions in securing blockchain data.126
9. Evaluate the impact of blockchain on transparency and trust in digital transactions.129
10. Describe the steps involved in creating and validating a new block in the blockchain network.131

Case Study:

11. How we Apply Blockchain Technology in Elections and Voting134

SHORT ANSWER QUESTIONS

12. Blockchain136
13. Data Blocks137
14. Chaining of Blocks137
15. Data Store Protection138
16. Peer-to-Peer Network138
17. Transaction Verification139
18. Adding Transactions140

BCom_BCT5EM – List of Questions

xv

19. Consensus Mechanism	.....140
20. Hash Functions	.....141
21. Distributed Ledger	.....141
22. Decentralization	.....142
23. Transparency	.....142
24. Security in Blockchain	.....143
25. Block Validation	.....144

UNIT-V: CHOOSING A TRANSACTION HISTORY

LONG ANSWER QUESTIONS

1. Explain the process of choosing a transaction history in the blockchain system.145
2. Discuss the concept of paying for integrity in blockchain and its implications.147
3. Analyze the technical limitations of blockchain technology.150
4. Describe the conflicting goals associated with blockchain development and usage.152
5. Explain the key characteristics of blockchain technology.154
6. Evaluate the various applications of blockchain across different industries.155
7. Discuss the features and uses of popular blockchain platforms.157
8. Compare public and private blockchain platforms with suitable examples.160

9. Examine the challenges in achieving scalability and speed in blockchain systems.161
10. Analyze the trade-offs between security, decentralization, and performance in blockchain networks.164
11. Identify various Blockchain Technologies used in Entertainment166

SHORT ANSWER QUESTIONS

12. Transaction History168
13. Integrity in Blockchain168
14. Technical Limitations169
15. Conflicting Goals170
16. Characteristics of Blockchain171
17. Blockchain Applications172
18. Blockchain Platforms173
19. Public Blockchain173
20. Private Blockchain174
21. Decentralization vs Performance175
22. Security Trade-offs176
23. Scalability Challenges177
24. Blockchain in Finance178
25. Blockchain in Supply Chain178

