Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

School of Computer Science & Engineering

Mid - Term Examinations - November 2024

Semester: VII | **Date**: 05-11-2024

Course Code: CSE3022 | **Time**: 09.30am to 11.00am

Course Name: Cryptocurrency Technology | **Max Marks**: 50

Program: B. Tech | **Weightage**: 25%

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **5Qx2M=10M**

1	Define cryptography and identify its key objectives in digital security.	2 Marks	L1	CO1
2	How digital signatures work give an example of their use in transactions.	2 Marks	L1	CO1
3	How do cryptographic hash functions ensure data integrity.	2 Marks	L1	CO2
4	List the features of a hash pointer and outline its role in blockchain technology.	2 Marks	L1	CO2
5	What are Merkle Tress ?	2 Marks	L1	CO2

Part B

Answer ALL Questions. Each question carries 10 marks. **4QX10M=40M**

6	**a.**	Define Proof of Work (PoW) and its role in Bitcoin mining.	2 Marks	L1	CO1
	b.	Explain how PoW prevents double-spending in the Bitcoin network.	3 Marks	L2	CO1
	c.	Identify the impact of PoW on the overall security of cryptocurrency networks.	5 Marks	L3	CO1

or

7	**a.**	What is decentralized consensus in blockchain.	2 Marks	L1	CO1
	b.	Explain the importance of decentralized consensus in enhancing blockchain security.	3 Marks	L2	CO1
	c.	Identify the challenges faced by decentralized consensus mechanisms.	5 Marks	L3	CO1
8	**a.**	What are the main types of cryptographic hash functions.	2 Marks	L1	CO1
	b.	Explain how hash functions contribute to data integrity in blockchain systems.	3 Marks	L2	CO1
	c.	Apply the concept of hash functions and how do they secure a blockchain transaction.	5 Marks	L3	CO1
		Or			
9	**a.**	List the advantages of using virtual mining, such as Peer coin.	2 Marks	L1	CO1
	b.	Illustrate the limitations of virtual mining in the cryptocurrency ecosystem.	3 Marks	L2	CO1
	c.	Identify the effectiveness of virtual mining compared to traditional mining methods.	5 Marks	L3	CO1
10	**a.**	What is the significance of cryptographic keys as identities in Bitcoin transactions.	2 Marks	L1	CO2
	b.	Compare the differences between public and private keys in the context of digital signatures.	3 Marks	L2	CO2
	c.	Apply the concept of key pairs to analyze their role in enhancing transaction security.	5 Marks	L3	CO2
		or			
11	**a.**	What are the components of a blockchain, list their functions.	2 Marks	L1	CO2
	b.	Explain how blockchain's append-only nature ensures data integrity.	3 Marks	L2	CO2
	c.	Identify the implications of immutability in blockchain for financial transactions.	5 Marks	L3	CO2

12	**a.**	Define Merkle Trees and identify their purpose in blockchain technology.	2 Marks	L1	CO2
	b.	Explain how Merkle Trees enhance the efficiency of data verification.	3 Marks	L2	CO2
	c.	Apply the concept of Merkle Trees to demonstrate their role in transaction verification.	5 Marks	L3	CO2
		or			
13	**a.**	What is the motivation behind mining in cryptocurrency networks.	2 Marks	L1	CO2
	b.	Explain the relationship between mining rewards and network security.	3 Marks	L2	CO2
	c.	Illustrate the long-term sustainability of the mining incentive model in cryptocurrencies.	5 Marks	L3	CO2