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## BENGALURU School of Computer Science & Engineering Mid - Term Examinations - November 2024

Semester: VII Date: 0			5-11-202	4			
Course Code: CSE3022 Time: C			09.30am to 11.00am				
Cou	rse Name: Cryptocurrency Technology M	Max Ma	<b>rks</b> : 50				
Pro	gram: B. Tech V	Weighta	age: 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	y.	2 Marks	L1	C01		
2	How digital signatures work give an example of their use in transact	tions.	2 Marks	L1	C01		
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

Ansv	Answer ALL Questions. Each question carries 10 marks.				
6	a.	Define Proof of Work (PoW) and its role in Bitcoin mining.	2 Marks	L1	C01
	b.	Explain how PoW prevents double-spending in the Bitcoin network.	3 Marks	L2	C01
	C.	Identify the impact of PoW on the overall security of cryptocurrency networks.	5 Marks	L3	C01

b.Explain the importance of decentralized consensus in enhancing blockchain security.3 MarksL2c.Identify the challenges faced by decentralized consensus mechanisms.5 MarksL38a.What are the main types of cryptographic hash functions. Explain how hash functions contribute to data integrity in blockchain systems.2 MarksL1b.Explain how hash functions contribute to data integrity in blockchain systems.3 MarksL2c.Apply the concept of hash functions and how do they secure a blockchain transaction.5 MarksL39a.List the advantages of using virtual mining, such as Peer coin.2 MarksL1b.Illustrate the limitations of virtual mining in the cryptocurrency ecosystem.3 MarksL2c.Identify the effectiveness of virtual mining compared to traditional mining methods.5 MarksL310a.What is the significance of cryptographic keys as identities in Bitcoin transactions.2 MarksL1b.Compare the differences between public and private keys in the context of digital signatures.3 MarksL2c.Apply the concept of key pairs to analyze their role in enhancing transaction security.5 MarksL3ororIa.What are the components of a blockchain, list their functions.2 MarksL3Ia.What are the components of a blockchain, list their functions.2 MarksL3I<							
<ul> <li>r enhancing blockchain security.</li> <li>c. Identify the challenges faced by decentralized consensus 5 Marks 1.3 mechanisms.</li> <li>8 a. What are the main types of cryptographic hash functions. 2 Marks 1.1</li> <li>b. Explain how hash functions contribute to data integrity in 3 Marks 1.2</li> <li>c. Apply the concept of hash functions and how do they secure a blockchain ransaction.</li> <li>9 a. List the advantages of using virtual mining, such as Peer coin.</li> <li>9 a. List the advantages of using virtual mining in the cryptocurrency ecosystem.</li> <li>c. Identify the effectiveness of virtual mining compared to 5 Marks 1.3</li> <li>identities in Bitcoin transactions.</li> <li>10 a. What is the significance of cryptographic keys as identities in Bitcoin transactions.</li> <li>b. Compare the differences between public and private keys 3 Marks 1.2</li> <li>in the context of digital signatures.</li> <li>c. Apply the concept of key pairs to analyze their role in shancing transaction security.</li> <li>11 a. What are the components of a blockchain, list their functions.</li> <li>b. Explain how blockchain's append-only nature ensures 3 Marks 1.2</li> <li>c. Identify the implications of immutability in blockchain 5 Marks 1.2</li> </ul>		a.	What is decentralized consensus in blockchain.	2 Marks	L1	C01	
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		b.		3 Marks	L2	CO2	
		C.		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