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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

January / February 2025 Semester End Main Examinations

Programme: B.E. **Semester: VI**
Branch: Computer Science and Engineering **Duration: 3 hrs.**
Course Code: 22CS6PCBLC **Max Marks: 100**
Course: Blockchain

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

		UNIT - I	CO	PO	Marks
1	a)	Blockchain acts as a layer within a distributed peer to-peer network. Discuss the various layers that form the architecture view of a generic blockchain	CO1	PO1	8
	b)	Differentiate between public, private and permissioned blockchain.	CO2	PO2	6
	c)	Explain the three main properties required for Zero knowledge proof with a help of an example.	CO1	PO1	6
		OR			
2	a)	"Popular Bank" is considering to upgrade their software to run on a blockchain based network. Help the bank to make a clear decision by listing out atleast ten pros and cons of the new technology.	CO2	PO2	6
	b)	What is the technical definition of a blockchain? Elaborate on the keywords used to define it.	CO1	PO1	8
	c)	Compare and contrast centralized and decentralized systems on the basis of various features.	CO2	PO2	6
		UNIT - II			
3	a)	Outline the Byzantine generals problem and discuss the two major fault tolerance techniques.	CO2	PO2	6
	b)	Explain the following: i) Genesis Block ii) Replication	CO1	PO1	6
	c)	Outline the step by step process by which a transaction is added into a blockchain.	CO1	PO1	8
		OR			
4	a)	Discuss the Markle tree data structure and why is it Important For Blockchain?	CO1	PO1	6
	b)	Differentiate between hard fork and soft fork.	CO2	PO2	6

		c)	What are Stale and orphan blocks? Explain with scenario as to how are these blocks formed and what is their validity.	*CO2*	*PO2*	**8**
			UNIT - III			
	5	a)	With the help of a neat diagram explain the elements present in the Ethereum blockchain briefly.	*CO2*	*PO2*	**8**
		b)	Outline the features of Smart Contracts.	*CO3*	*PO3*	**6**
		c)	Develop a simple program using Solidity to demonstrate the concept of inheritance.	*CO3*	*PO3*	**6**
			OR			
	6	a)	Ethereum uses a mechanism that ensures that infinite loops cannot cause the whole blockchain to stall. Identify the mechanism and illustrate how it is used.	*CO3*	*PO3*	**6**
		b)	Differentiate between pure functions and view functions with an example program for each.	*CO2*	*PO2*	**6**
		c)	Write a smart contract to create a structure to store student details of CSE Department, BMSCE and add a function to increment the count each time a new student takes admission into the specified department.	*CO3*	*PO3*	**8**
			UNIT - IV			
	7	a)	Explain: i) Double Spending ii) Sybil Attack	*CO1*	*PO1*	**6**
		b)	Consider a scenario and explain the process of sending Bitcoins using the Blockchain wallet for mobile devices.	*CO2*	*PO2*	**8**
		c)	Outline some of the alternatives to PoW.	*CO1*	*PO1*	**6**
			OR			
	8	a)	Explain the different types of Bitcoin wallets with the advantages and disadvantages for each.	*CO1*	*PO1*	**8**
		b)	Differentiate between Proof of Work and Proof of Stake with a neat diagram.	*CO1*	*PO1*	**6**
		c)	Compare and contrast genesis block, stale block and orphan blocks with necessary diagrams.	*CO1*	*PO1*	**6**
			UNIT - V			
	9	a)	Explain the Hyperledger reference architecture with a neat diagram	*CO1*	*PO1*	**10**
		b)	List out the features and benefits of the Hyperledger Sawtooth	*CO1*	*PO1*	**10**
			OR			
	10	a)	Outline the features and benefits of the following: (i) Hyperledger Fabric (ii) Iroha (iii) Indy	*CO1*	*PO1*	**10**
		b)	Analyze the need for transaction families in blockchain and explain how Sawtooth addresses the transaction families with a neat diagram.	*CO1*	*PO1*	**10**

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