



Model Question Paper

Sixth Semester BE Degree Examination

Blockchain Technology

Time: 3 Hours (180 Minutes)

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.

2. M: Marks, L: RBT (Revised Bloom's Taxonomy) level, C: Course outcomes.

Module - 1			M	L	C
Q1	a.	Justify the need of Distributed Systems. Explain core Characteristics of Distributed System. Why consensus algorithm is needed and what are its requirements.	10	L3	CO1
	b.	Define Blockchain and justify its need. With neat diagram explain layered architecture of the Blockchain.	10	L2	CO1
OR					
Q2	a.	Explain Design goals of Distributed System. Apply the principles of the CAP theorem to evaluate the trade-offs between consistency and availability in distributed applications.	10	L3	CO1
	b.	Explain the Generic Elements of a Blockchain. What are the limitations of Blockchain?	10	L2	CO1
Module- 2					
Q3	a.	Justify the need of Decentralization and explain the Methods of Decentralization in Blockchain Systems. Why Smart contracts are needed in Blockchain Systems.	10	L3	CO2
	b.	With the help of neat diagram explain symmetric cryptography. What are demerits of symmetric cryptography and how it is resolved?	10	L3	CO2
OR					
Q4	a.	Explain the concept of Smart Contracts. How do they enable decentralization in Blockchain-based systems? Illustrate with a suitable example.	10	L3	CO2
	b.	Explain the RSA algorithm in detail. Describe how RSA keys are generated, how encryption and decryption are performed, Illustrate the algorithm with a numerical example.	10	L3	CO2
Module - 3					
Q5	a.	Describe the design and core features of Ricardian contracts. Explain how they combine human-readable legal agreements with machine-readable digital logic. Compare them with Smart Contracts.	10	L3	CO3
	b.	Describe the structure of Bitcoin Block? What are Bitcoin wallets? Explain the different types of Bitcoin wallets in detail.	10	L2	CO3
OR					
Q6	a.	Explain the structure of a Bitcoin block with a neat diagram and describe each field of the block header. Discuss how blocks are linked together to form a secure chain.	10	L3	CO3
	b.	Explain the structure of a Bitcoin transaction in detail. Discuss inputs, outputs, scripts (scriptSig and scriptPubKey), UTXOs, and how digital signatures secure the transaction process.	10	L2	CO3

Module - 4					
Q7	a.	Describe the structure of an Ethereum transaction and explain the different transaction components and gas mechanism.	10	L2	CO4
	b.	Assume you are setting up a new Ethereum wallet and client software. Explain how you would interact with the Ethereum network and supporting protocols to deploy a smart contract safely.	10	L3	CO4
OR					
Q8	a.	Describe keys and addresses in Ethereum. Discuss the architecture and role of the Ethereum Virtual Machine (EVM) in executing smart contracts.	10	L2	CO4
	b.	Illustrate the consensus mechanism and forks in Blockchain and explain how they maintain the integrity of the Ethereum network.	10	L3	CO4
Module - 5					
Q9	a.	Explain the Hyperledger reference architecture and discuss the major components involved in enterprise Blockchain implementation.	10	L2	CO5
	b.	Illustrate how the design principles of Hyperledger support the development of secure and scalable enterprise Blockchain applications.	10	L3	CO5
OR					
Q10	a.	Discuss the design principles of Hyperledger and their importance in enterprise Blockchain development.	10	L2	CO5
	b.	Demonstrate the transaction processing workflow in Hyperledger Fabric. Illustrate how distributed ledger technology can be applied in enterprise applications using Hyperledger Fabric.	10	L3	CO5