MANGALORE INSTITUTE OF TECHNOLOGY & ENGINEERING
(A Unit of Rajalaxmi Education Trust®, Mangalore)
Autonomous Institute affiliated to VTU, Belagavi, Approved by AICTE, New Delhi
Accredited by NAAC with A+ Grade & ISO 9001:2015 Certified Institution

Model Question Paper

Third Semester MCA Degree Examination

Blockchain Technology

Time: 3 Hours

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.	A supply chain consortium wants to share product movement details among stakeholders without a trusted central authority. Apply blockchain architecture and explain how decentralization and immutability establish trust in this system.	10	L3	CO1
	b.	You are asked to demonstrate blockchain fundamentals in a classroom setting. Apply core blockchain components such as blocks, hashes, nonce, previous hash, and transactions to illustrate a simple blockchain working model.	10	L3	CO1
		OR			
Q2	a.	An enterprise system experiences frequent outages due to centralized infrastructure. Apply the distributed nature of blockchain to explain how availability and fault tolerance can be improved.	10	L3	CO1
	b.	A digital payment platform wants tamper-proof storage of transaction records. Use blockchain architecture to explain how transparency and security are simultaneously achieved in this context.	10	L3	CO1
		Module- 2			
Q3	a.	A sustainability-focused startup requires a secure blockchain system with low energy consumption. Apply consensus mechanisms and recommend a suitable approach with justification.	10	L3	CO2
	b.	A public blockchain network observes mining power concentration among a few entities. Apply the Nakamoto Coefficient to analyze decentralization risks and suggest improvement measures.	10	L3	CO2
		OR			
Q4	a.	A decentralized platform aims to prevent validator dominance. Apply tokenomics principles to explain how reward distribution can encourage fairness.	10	L3	CO2
	b.	A blockchain startup wants to benchmark its decentralization against competitors. Apply measurable decentralization metrics and explain how such comparisons can be performed.	10	L3	CO2
		Module - 3			
Q5	a.	User A wants to verify the legitimacy of cryptocurrency received from User B without intermediaries. Apply blockchain verification properties to explain how authenticity is ensured.	10	L3	CO3
	b.	A cryptocurrency payment gateway must avoid duplicate transactions. Apply Bitcoin's consensus and network design to explain how double spending is prevented.	10	L3	CO3
		OR			
Q6	a.	A crypto exchange needs secure storage for customer assets. Apply cryptographic key management techniques to explain how asset security can be ensured.	10	L3	CO3

	b.	A fintech company demands faster confirmations than Bitcoin offers. Apply alternative blockchain platforms and explain how they improve transaction speed.	10	L3	CO3
Module - 4					
Q7	a.	A real-estate platform wants transactions to execute automatically after payment confirmation. Apply smart contract concepts to explain how this automation is achieved.	10	L3	CO4
	b.	A decentralized application requires inter-contract communication. Use Ethereum transactions and message calls to illustrate how communication can be implemented.	10	L3	CO4
OR					
Q8	a.	A blockchain startup aims to reduce transaction fees for users. Apply Ethereum scaling solutions and explain their working.	10	L3	CO4
	b.	A smart contract developer wants to reduce gas consumption during data storage. Apply optimization strategies to explain how gas usage can be minimized.	10	L3	CO4
Module - 5					
Q9	a.	A banking organization wants to automate compliance verification. Apply blockchain-enabled RPA to explain how automation and trust can be achieved.	10	L3	CO5
	b.	A logistics firm requires real-time validation of vehicle telemetry data. Apply IoT and blockchain integration to illustrate how secure tracking is enabled.	10	L3	CO5
OR					
Q10	a.	An enterprise wants freedom from vendor lock-in in cloud environments. Apply blockchain-based cloud solutions to explain how flexibility is achieved.	10	L3	CO5
	b.	A human resource platform needs to verify employee credentials securely. Apply blockchain-based identity verification and explain the process with a suitable example.	10	L3	CO5

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