



PRESIDENCY UNIVERSITY

BENGALURU

Roll No.														
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End - Term Examinations –May/June 2026

Date: 19-05-2026

Time: 09:30am – 12:30pm

School: SOIS	Program: BCAAIML	
Course Code: CSA3802	Course Name: AI IN BLOCKCHAIN	
Semester: IV	Max Marks: 100	Weightage: 50%

CO - Levels	C01	C02	C03	C04	C05
Marks	26	26	24	24	

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.

10Q x 2M=20M

1.	Define Artificial Intelligence (AI) and mention its scope.	2 Marks	L1	C01
2.	State how hashing ensures data integrity and security in blockchain systems.	2 Marks	L1	C01
3.	Spell the need for a nonce in blockchain transactions?	2 Marks	L1	C01
4.	Define Sybil attack with respect to decentralized networks.	2 Marks	L1	C02
5.	State any two roles of AI in blockchain fraud detection.	2 Marks	L1	C02
6.	List any two transaction features used for anomaly detection.	2 Marks	L1	C02
7.	What is meant by scalability in blockchain networks?	2 Marks	L1	C03
8.	How can AI improve transaction validation processes in distributed ledgers?	2 Marks	L1	C03
9.	What are smart contracts?	2 Marks	L1	C04
10.	List any two benefits of AI-generated smart contracts over manually coded contracts.	2 Marks	L1	C04

Part B

Answer the Questions.

Total Marks 80M

11.	a.	Demonstrate the transaction lifecycle in a blockchain system, from transaction initiation to confirmation. Explain how miners contribute to transaction validation and block creation.	10 Marks	L2	CO1
	b.	Explain the need for consensus mechanisms in decentralized systems. Explain Proof of Stake (PoS) and discuss its advantages. Compare PoW PoS and DPoS and briefly explain Practical Byzantine Fault Tolerance (PBFT).	10 Marks	L2	CO1
Or					
12.	a.	Interpret the fundamentals of machine learning and discuss the types of supervised, unsupervised, and reinforcement machine learning algorithms with an example.	10 Marks	L2	CO1
	b.	Explain the construction process of a Merkle tree and the generation of hashes at each level. Additionally, discuss the significance of the Merkle root in a blockchain block and its role in the verification process.	10 Marks	L2	CO1

13.	a.	A national healthcare network plans to implement an advanced digital medical system using Blockchain and Artificial Intelligence (AI). Patient records, prescriptions, diagnostic reports, and treatment histories are stored on a secure Blockchain to prevent tampering and unauthorized access. Hospitals, laboratories, pharmacies, and insurance providers can access the data with patient consent. AI algorithms analyse these records to assist doctors in disease diagnosis, predict health risks, recommend personalized treatments, and detect fraudulent insurance claims. Explain taking any case study of healthcare implemented with blockchain technology and AI that ensures security and integrity of patient medical records.	10 Marks	L2	CO2
	b.	Demonstrate autoencoders and LSTM models of deep learning techniques used for anomaly detection in blockchain systems with suitable examples.	10 Marks	L2	CO2

Or

14.	a.	Explain machine learning and deep learning approaches used in blockchain fraud detection. Compare both approaches with suitable examples and discuss their advantages and limitations.	10 Marks	L2	CO2
	b.	Explain the working of Logistic Regression and Random Forest algorithms for blockchain fraud detection. Compare their performance and suitability for different fraud scenarios.	10 Marks	L2	CO2

15.	a.	Examine the scalability challenges of blockchain systems and evaluate how AI techniques can reduce computational overhead and latency.	10 Marks	L4	CO3
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	b.	Analyse Proof of Learning (PoL) as an emerging consensus mechanism. Discuss its architecture, working principles, advantages, and potential challenges.	10 Marks	L4	C03
Or					
16.	a.	Compare AI-enhanced PoW, PoS, and PoL consensus mechanisms with respect to performance, security, energy consumption, and decentralization.	10 Marks	L4	C03
	b.	Examine the application of deep learning and reinforcement learning in mining optimization and resource allocation within blockchain ecosystems.	10 Marks	L4	C03

17.	a.	Summarize machine learning approaches for detecting vulnerabilities in smart contracts. Illustrate with examples of common attack patterns such as re-entrancy, overflow, and access control flaws.	10 Marks	L2	C04
	b.	Compare traditional rule-based smart contract automation with AI-driven adaptive automation in DeFi applications, highlighting performance, scalability, and resilience.	10 Marks	L4	C04
Or					
18.	a.	Explain the architecture of an AI-driven framework for secure smart contract development, from code generation to deployment and monitoring.	10 Marks	L2	C04
	b.	Examine the role of AI in automating Decentralized Finance (DeFi) operations such as lending, trading, liquidity management, and risk assessment.	10 Marks	L4	C04