Roll No.

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. / B. Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, NOV / DEC 2023

INFORMATION TECHNOLOGY
Semester 7
IT5034 BLOCKCHAIN TECHNOLOGIES
(Regulation 2019)

Time: 3hrs   Max.Marks: 100

CO 1	Understand the technology components of Blockchain and how it works behind the scenes
CO 2	Identify different approaches to developing decentralized applications.
CO 3	Understand Bitcoin and its limitations by comparing with other alternative coins.
CO 4	Devise solution using the Ethereum model.
CO 5	Understand and use Hyperledger and its development framework
CO 6	Track alternative Blockchains and emerging trends in Blockchain.

BL – Bloom's Taxonomy Levels
(L1 - Remembering, L2 - Understanding, L3 - Applying, L4 - Analyzing, L5 - Evaluating, L6 - Creating)

PART- A (10 x 2 = 20 Marks)
(Answer all Questions)

Q. No	Questions	Marks	CO	BL
1	Explain double spending problem.	2	CO1	L2
2	How does Decentralized Autonomous Organization differ from traditional organizations in terms of structure and decision – making?	2	CO2	L3
3	What is the significance of Merkle tree in a blockchain?	2	CO3	L1
4	List any four drawback associated with bitcoin scripting language.	2	CO3	L4
5	What is decentralized finance (DeFi) on Ethereum?	2	CO4	L2
6	What is the purpose of Gas in Ethereum?	2	CO4	L1
7	Discuss the significance of channels in Hyperledger Fabric.	2	CO5	L1
8	Differentiate Web 2.0 and Web 3.0	2	CO5	L4
9	What are the key components of RippleNet?	2	CO6	L2
10	List any four common issues associated with cryptocurrency wallets.	2	CO1	L4

PART- B (5 x 13 = 65 Marks)
(Restrict to a maximum of 2 subdivisions)

Q. No	Questions	Marks	CO	BL
11 (a) (i)	Elucidate the fundamental cryptographic principles employed in blockchain technology. How do they contribute to the secure functioning of a blockchain?	13	CO1	L1
	OR			
11 (b) (i)	How does consensus work in blockchain technology, give an overview of the various consensus algorithms employed by blockchain networks.	13	CO2	L2
12 (a) (i)	Explain the proof-of-work concept in Bitcoin mining, detailing the cryptographic puzzles that miners must solve to add new blocks to the blockchain. Discuss the significance of the difficulty level in	13	CO3	L4

	these puzzles and mining the impact of mining pools and mining hardware.			
	OR			
12 (b) (i)	Explain the diverse landscape of cryptocurrencies, including altcoins (alternative cryptocurrencies) and tokens. For any one cryptocurrency of your choice explain the unique features, use cases, and underlying technologies.	13	CO3	L2
13 (a) (i)	Explain in detail what the Ethereum Virtual Machine is, its purpose, and how it functions within the Ethereum ecosystem. Additionally, elaborate on the concept of gas in the context of the EVM, discussing its significance, how it is utilized, and the role it plays in maintaining the security and efficiency of the Ethereum network	13	CO4	L4
	OR			
13 (b) (i)	How do smart contracts function within the Ethereum blockchain, and what are the key features and advantages that distinguish Ethereum's smart contract implementation.	13	CO4	L2
14 (a) (i)	How can the implementation of Web3 technologies improve the privacy and security of online transactions?	5	CO4	L4
(ii)	Explain the key design principle and consensus in Corda?	8	CO4	L1
	OR			
14 (b) (i)	Provide a comprehensive overview of the architecture of Hyperledger Fabric. How does it differ from public blockchain architectures, and what are the key design principles that contribute to its suitability for enterprise applications?	13	CO5	L3
15 (a) (i)	Explain the distinctions between alternative and conventional blockchains, considering their architectures, consensus mechanisms, and potential applications.	13	CO6	L4
	OR			
15 (b) (i)	With an use case, explain how blockchain can be applied to healthcare industry.	13	CO2	L2

PART- C (1 x 15 = 15 Marks)
(Q.No.16 is compulsory)

Q. No	Questions	Marks	CO	BL
16.	Analyze security concerns related to blockchain technology, including vulnerabilities, potential for 51% attacks, and the risk of illicit activities. How can the decentralized nature of blockchain both enhance and pose challenges to security?	15	CO6	L4