Nirma University
Institute of Technology
Semester End Examination (IR), February - 2022
B. Tech. in Computer Science and Engineering, Semester-VII
2CSDE93 Blockchain Technology

Roll / Exam No.		Supervisor's initial with date	

Time: 2 Hours   Max. Marks: 50

Instructions:
1. Attempt all questions.
2. Figures to right indicate full marks.
3. Draw neat sketches wherever necessary.
4. Attempt questions in sequence only.

Q-1.	**Do as directed:**	**[15]**
A **CO1BL4**	Differentiate between distributed and decentralized systems and discuss whether the blockchain is one of them or not? Justify your answer.	[05]
B **CO1BL2**	Describe the usage of smart contracts for supply chain management. Also, illustrate how the smart contract can be framed between retailer, customer, and manufacturer.	[05]

OR

B **CO4BL2**	List out the advantages of Blockchain-enabled Cheque Clearance System for financial institutions. Use diagrammatic approach to validate your answer.	[05]
C **CO1BL3**	What is Hashcash? How this Hashcash PoW Mechanism works? Explain it with one suitable example.	[05]
Q-2.	**Do as directed:**	**[20]**
A **CO3BL2**	Alice wants to develop a secure distributed system where she wants to keep track of the node identity. Additionally, she wants to use a fixed message content representation scheme in which any node in the system can transfer the message of any size. You as a system consultant, suggest a consensus protocol to Alice, which is extremely suitable for her system.	[10]

OR

A **CO3BL4**	Suppose, 15 trustworthy nodes are performing some task distributely. As per the process, at a certain interval, every node of the team shares the results for making the consensus. After starting the task, 7 trustworthy nodes drop the plan and they are replaced by 7 other nodes whose trustworthy information is unknown. After joining the new nodes, some discrepancy occurs in the system, although all the nodes are running correctly without any software or hardware error. What is the type of fault it is in the context of distributed consensus? Give proper reason for your answer.	[10]
B **CO4BL4**	After 21 million bitcoins are mined, will not the use of bitcoins come to an end? (i) The hardware during that time will be many times more fast,	[10]

complex and expensive. How will miners survive without rewards? The miners will thus cease to express interest as they will run into heavy losses. This will bring mining to a halt and eventually no one will be there to generate new blocks.

(ii) Can this prove out to be tragic for all those who will be investing into bitcoin? Because their cryptocurrency will be jammed into that network from where they can't move it anywhere!

Q-3.	**Do as directed:**		**[15]**
A **CO3BL2**	Suppose you have twelve data points from 0 to 11. Find the in order traversal of the Merkle Tree (here 0 means hash of 0, 01 means the combined hash of 0 and 1, and so on)		[05]
B **CO3BL2**	How to adopt the blockchain technology in Connected Autonomous Vehicles? Use diagrammatic representation for your explanation.		[05]
C **CO2BL1**	Write your view point on the "Design Limitations of Permissioned environment". Do we really need to execute contracts at each node in the Permissioned Blockchain?		[05]