Nirma University

Institute of Technology

Sessional Examination, October 2022

B. Tech in Computer Science and Engineering, Semester: VII

2CSDE93: Blockchain Technology

Roll/ Exam No		Supervisor's initial with date	

Time: 1 hour15 minutes Max Marks: 40

Instructions:

i) Attempt all questions.
ii) Figures to the right indicate full marks.
iii) Draw neat sketches wherever necessary.
iv) Assume necessary data wherever required and specify clearly.

Q.1. A smart contract is be implemented to identify various sports related talent from the pool of school students. Answer the following considering this case study: CO4 BL4 **[10]**

i) Identify set of stake holders (with justification) involved in this case study. [04]

ii) Suggest required attributes and functions for smart contract mentioning about the importance of the function. [04] [02]

iii) What is the difference between compilation and deployment of a contract?

Q.2. Answer the following (to the point) with regards to Blockchain Network: CO2 BL2 **[05]**

a. What are the various types of nodes?
b. State the relevance of Merkle tree.
c. State the various fields of a block.
d. What is the reason to mine?
e. Are the blocks in the blockchain encrypted?

Q.3. Name the Security Mechanism which implements the following security services. Also mention the name of algorithm that achieves the said service. CO1 BL2 **[05]**

a. Confidentiality
b. Authentication
c. Non-repudiation
d. Integrity
e. Notorization

Q.4. With a neat and labelled diagram, explain the working of Digital Signatures. CO1 BL1 **[05]**

Q.5. Answer the following questions with reference to Consensus: CO3 BL5 **[09]**

a. Explain working of PoW mechanism.
b. How do you set the difficulty of the mining algorithm?
c. How does the Proof of Elapsed Time Consensus algorithm work?

Q.6. Answer the following questions: CO3 BL2 **[06]**

a. What are the orphaned blocks and how to remove them?
b. What does a faulty miner do?
c. How are the smart contracts maintained in a permissioned blockchain?