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Bharatiya Vidya Bhavan's
Sardar Patel Institute of Technology
Munshinagar, Andheri(W), Mumbai-400058
Department of Information Technology
OEIT1: Blockchain Technology and Applications
TY B.Tech (EXTC/COMP/IT)
End Semester Examination

Date: 15/05/2023

Total: 100 Marks
Duration: 180 Minutes

Note:

- [1] Answer all questions.
- [2] Assume suitable data if necessary stating with clearly.
- [3] Read the each question carefully and follow instructions given for each question if any.
- [4] Keep your answers clear and concise, and state all of your assumptions carefully.

Q. No	Question	Marks	BL	CO
Q.1 a)	Differences between bitcoin, ethereum and Hyperledger fabric.	10	3	CO1
Q.1 b)	Define the Zero-Knowledge Proof (ZKP)? How do you use it in blockchain?	10	3	,2 CO1 ,2
Q.2 a)	How would you design a dApp that effectively utilizes blockchain technology and meets the needs of its users?	10	4	CO3
Q.2 b)	How might the integration of blockchain technology and artificial intelligence (AI) impact the future of decentralized autonomous organizations (DAOs)? Provide specific examples of how this integration could create new opportunities for DAOs to operate in innovative and disruptive ways. (Precise and concise answer)	5	5	CO4
Q2. c)	What is Merkle Tree? How important are Merkle trees in Blockchains? How do we build the Merkle tree in case of odd number of transactions?	5	3	CO1
Q.3 a)	Critically evaluate the potential of blockchain technology to revolutionize the healthcare industry. Discuss the benefits and challenges of using blockchain in healthcare data management, patient privacy, and medical research.	10	5	CO4
Q.3 b)	With respect to Bitcoin Blockchain describe the following terms: Nonce Target/Difficulty Timestamp SegWit	10	3	CO1

Q4. a)	Draw a neat block diagram of Hyperledger Fabric Architecture with components and describe in brief. OR Evaluate the role of Blockchain in Metaverse	10	3	CO4
Q.4 b)	List some of the popular consensus algorithms? Why we need different consensus mechanisms? How select the consensus algorithm? OR Describe the process of writing and deploying smart contracts on blockchain networks.	10	3	CO1 ,CO 2
Q.5 a)	Design and develop a real estate token decentralized application representing new real estate developments in a town. The town supervisor can add a piece of real estate as an asset (RES4 token) and at the same time assign it to an owner. This task is accomplished by the process of the creation of the RES4 token. (Assume that the funds for asset ownership are transferred by other means that are not within the scope of this problem.) The token owner can add value to the token by building on it, as well as approve a sale to a buyer, and an approved buyer can buy the asset. The real estate asset may also appreciate or depreciate as determined by a town's assessor. For simplicity, assume that the town supervisor and the assessor have the same identity, and that they represent the town and perform operations on behalf of the city. Draw use case diagram and process flow.	10	6	CO3 ,4
Q5. b)	How can you ensure that your testing strategy for Ethereum smart contracts is effective and provides sufficient coverage for all potential scenarios?	10	5	CO2