



Bharatiya Vidya Bhavan's
Sardar Patel Institute of Technology
Munshinagar, Andheri(W), Mumbai-400058

Department of Information Technology

IT424/CS474/MC521: Blockchain Technology and Applications

TY B.Tech (ETRX/EXTC/COMP/IT) and MCA SY MCA Sem-IV

End Semester Examination

Date: 18/05/2022

Total:60 Marks

Duration: 135 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	CO
Q.1 a)	What are the contents of block in blockchain? (Precise and concise answer)	2	CO1 ,2
Q.1 b)	Define the Zero-Knowledge Proof (ZKP)? How do you use it in blockchain? (Precise and concise answer)	4	CO1 ,2
Q.1 c)	What are cryptographic hash functions, asymmetric cryptography and digital signatures? How are they utilized to help make blockchain technology verifiable and immutable?	6	CO1
Q.2 a)	Which all domains will affect with Blockchain list down any four and explain any one? (Precise and concise answer)	2	CO4
Q.2 b)	What is permissioned or private distributed ledger technology? How does it differ from permissionless or open blockchain applications? (Precise and concise answer)	4	CO1
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?	6	CO1
Q.3 a)	How does Bitcoin record transactions? What is unspent transaction output (UTXO)?	2	CO1
Q.3 b)	What is smart contract? Write a sample code using Solidity Language	4	CO2
OR			
	With respect to Bitcoin Blockchain describe the following terms:		

	Nonce Target/Difficulty Timestamp SegWit <i>(Precise and short answer)</i>		
Q.3 c)	What is the Byzantine Generals problem? How does proof-of-work and mining in Bitcoin address it? More generally by blockchain technology? <i>(Precise and short answer)</i>	6	CO1
Q4. a)	Draw a neat block diagram of Hyperledger Fabric Architecture with components and describe in brief.	6	CO4 ,5
Q.4 b)	What is DAG in IoT? OR What are the benefits of IoT with Blockchain? <i>(Precise and short answer)</i>	4	CO1 ,CO 4
Q.4 c)	List some of the popular consensus algorithms? Why we need different consensus mechanisms? OR How to choose a consensus algorithm in Blockchain <i>(Precise and short answer)</i>	2	CO1 ,CO 5
Q.5 a)	With respect to Ethereum Blockchain, describe the following terms in brief: DApps DAO Hard Fork and Soft Fork Gas, Gas Price, Gas limit EVM	6	CO2 ,CO 3
Q5. b)	The company you work for is considering introducing blockchain technology to its administrative and financial procedures. However, not all parties involved are convinced. Even though you have explained that this innovative technology has the potential to significantly improve business transactions, you are asked to explain how smart contracts work and how they can improve contract implementation and monitoring processes. OR Suggest which type of blockchain should be used for the security of donations in a charity organization. What benefits does the blockchain technology introduce in such a scenario? Explain your answer using an example.	4	CO4
Q.5 c)	What is Multichain Technology? <i>(Precise and short answer)</i>	2	CO1