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Paper Id:

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Sub Code:KCS-714

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B.TECH.
(SEM VII) THEORY EXAMINATION 2022-23
BLOCKCHAIN ARCHITECTURE DESIGN

Time: 3 Hours

Total Marks: 100

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2x10 = 20**

- (a) How does Blockchain differ from relational databases?
- (b) What are the types of records that are present in the blockchain database?
- (c) Why is consensus mechanism required in the blockchain?
- (d) Explain different types of consensus algorithms.
- (e) Explain consensus algorithm used in the Hyperledger Fabric.
- (f) What is chaincode?
- (g) List any two financial application that are using blockchain.
- (h) How blockchain can be used in the supply chain management with example?
- (i) Explain Non-Fungible Tokens in land-records.
- (j) What are security aspects of blockchain?

SECTION B

2. Attempt any *three* of the following: **10x3 = 30**

- (a) Explain the key principles of blockchain that are helpful in eliminating the security threats that need to be followed.
- (b) Explain the major elements in blockchain ecosystem in detail with example.
- (c) Explain practical Byzantine Fault Tolerance (pBFT) in detail.
- (d) Illustrate blockchain in financial software and system with respect to insurance with example.
- (e) Draw and explain the architecture of digital identification system using blockchain.

SECTION C

3. Attempt any *one* part of the following: **10x1 = 10**

- (a) Draw and explain blockchain architecture in detail. What are the primary benefits of immutability in blockchain.
- (b) Explain the block in blockchain in detail. What is the block size of a block in the Bitcoin and the Ethereum blockchain.

- 4. Attempt any *one* part of the following: **10 x1 = 10****
- (a) Explain the concept of double spending. How is it works in the Bitcoin blockchain?
 - (b) What is the Merkle root? How is it implemented in the blockchain?
- 5. Attempt any *one* part of the following: **10x1 = 10****
- (a) Discuss the Hyperledger Fabric. What are the different types of transaction validation policies available in Hyperledger Fabric?
 - (b) Explain Hyperledger composer tool. Discuss various projects under the Hyperledger umbrella?
- 6. Attempt any *one* part of the following: **10x1 = 10****
- (a) Discuss “Fish supply chain” use case using blockchain.
 - (b) What is the concept of executing accounting? Does blockchain supports the same?
- 7. Attempt any *one* part of the following: **10x1 = 10****
- (a) How blockchain can be used in public distribution system and social welfare system? Discuss in detail.
 - (b) What are the security and privacy issues in blockchain?