



Paper id: 251017

Roll No:

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BTECH
(SEM VI) THEORY EXAMINATION 2024-25
BLOCKCHAIN ARCHITECTURE DESIGN

TIME: 3 HRS

M.MARKS: 70

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt all questions in brief.

02 x 7 = 14

Q no.	Question	CO	Level
a.	What is the purpose of a cryptographic hash function in blockchain?	1	K1
b.	List any two blockchain design primitives.	1	K1
c.	Mention two scalability challenges in blockchain systems.	2	K2
d.	State two major limitations of PoW.	2	K2
e.	Explain how chaincode differs from traditional Smart Contracts in blockchain platforms.	3	K3
f.	Provide two analytical insights on how blockchain enhances traceability and transparency in supply chain management.	4	K4
g.	Evaluate the impact of implementing digital identity systems in government sectors by discussing one key benefit and one potential risk.	4	K5

SECTION B

2. Attempt any three of the following:

07 x 3 = 21

a.	Explain basic crypto primitives used in blockchain with suitable examples.	1	K2
b.	Explain how permissioned blockchain consensus mechanisms help overcome the limitations of public blockchains.	2	K3
c.	Discuss Chaincode development and deployment steps in Hyperledger Fabric.	3	K4
d.	Discuss the impact of blockchain in financial services like capital markets and insurance.	4	K4
e.	Evaluate the feasibility of implementing blockchain-based systems in government infrastructure by assessing major challenges and potential solutions	4	K5

SECTION C

3. Attempt any one part of the following:

07 x 1 = 07

a.	Explain how the concept of digital currency evolved into distributed ledgers and eventually led to the development of blockchain technology.	1	K2
b.	Explain the benefits and limitations of permission and permission less blockchain systems.	1	K2

4. Attempt any one part of the following:

07 x 1 = 07

a.	Analyze the methods used by popular blockchain protocols to improve scalability.	2	K3
b.	Describe how Proof of Work (PoW) influences energy use and scalability in blockchain systems.	2	K3

5. Attempt any one part of the following:

07 x 1 = 07

a.	Explain the end-to-end transaction flow in Hyperledger Fabric by describing the roles of peers, orderers, and chain code, and analyze how these components interact to ensure transaction validity and ordering.	3	K4
b.	Analyze the process of deploying a blockchain application using Hyperledger Composer and SDK, explaining each step and how these tools facilitate efficient blockchain development and deployment.	3	K4

6. Attempt any one part of the following:

07 x 1 = 07

a.	Discuss the impact of blockchain in financial services like capital markets and	4	K4
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	insurance.		
b.	Apply blockchain solutions for KYC and settlement processes in banking.	4	K4
7.	Attempt any <i>one</i> part of the following:	07 x 1 = 07	
a.	Analyze the significance of cryptographic security in blockchain and privacy-preserving techniques.	4	K5
b.	Evaluate the effectiveness of blockchain in ensuring transparency and reducing corruption in public schemes.	4	K5

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