NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M. Tech.

SEM: II - THEORY EXAMINATION (2020 - 2021)

Subject: Introduction to Blockchain

Time: 03:00 Hours   Max. Marks: 70

General Instructions:

○ All questions are compulsory. It comprises of three Sections A, B and C.
○ Section A - Question No- 1 is objective type question carrying 1 mark each & Question No- 2 is Very short type questions carrying 2 marks each.
○ Section B - Question No- 3 is Long answer type - 1 questions carrying 4 marks each.
○ Section C - Question No- 4 to 8 are Long answer type -2 questions carrying 7 marks each.

SECTION A   15

1. Attempt all parts:-

1.a.   A blockchain is a type of?[CO1]   1

            1. Object

            2. data

            3. Line

            4. View

1.b.   Block hash allows for the formation of the chain link by embedding previous block hash in   1
            the current block header. True or False? [CO2]

        1. TRUE

        2. FALSE

1.c.   What are the possible faults handled by PBFT? [CO3]   1

            1. Crash fault

            2. Byzantine Fault

            3. Both

            4. None

1.d.   The data structure used for storing the recent transaction output is:[CO4]   1

            1. Blockchain

            2. Merkle Tree

            3. World State

            4. Wallet

1.e.   When a record is submitted in a blockchain, how can you alter it?[CO5]   1

            1. You need the public and private key to modify the record

            2. Once submitted, records cannot be altered

3. Only a miner has the right to modify a record in a certain timeframe

4. Only smart contracts have the right to modify the record

2. Attempt all parts:-

2.a.	What is the genesis block?[CO1]	2
2.b.	Define hash chain? [CO2]	2
2.c.	Differentiate between Permissioned and Permissionless blockchain model ?[CO3]	2
2.d.	Explain mining principle behind bitcoin and ethereum.[CO4]	2
2.e.	What is Ethereum smart contracts?[CO5]	2

<div align="center">SECTION B   20</div>

3. Answer any <u>five</u> of the following-

3-a.	What do you mean by block in Blockchain Technology?Elaborate.[CO1]	4
3-b.	What is cryptography? What is its role in Blockchain?[CO1]	4
3-c.	Explain key generation of RSA algorithm.[CO2]	4
3-d.	What is a ledger? Is Blockchain an incorruptible ledger?[CO2]	4
3-e.	Compare PoW with PoS, PoB and PoET.[CO3]	4
3-f.	Describe the blockchain architecture for ethereum Blockchain.[CO4]	4
3-g.	How transaction flooding controlled in bitcoin network?[CO5]	4

<div align="center">SECTION C   35</div>

4. Answer any <u>one</u> of the following-

4-a.	Are there any network specific conditions for using Blockchain technology in an organization?[CO1]	7
4-b.	Why is Blockchain called an Immutable Public Ledger.[CO1]	7

5. Answer any <u>one</u> of the following-

5-a.	Analyze the characteristics of cryptographically secured hash function and their use in blockchain.[CO2]	7
5-b.	Discuss the properties of hash functions.[CO2]	7

6. Answer any <u>one</u> of the following-

6-a.	How proof of work based blockchain network defers following attacks:1.Double spending 2. Sybil Attack [CO3]	7
6-b.	Compare permissioned and permissionless blockchain .[CO3] • Consensus mechanism • Privacy of data and transactions • Scalability of nodes • Throughput of transactions	7

7. Answer any <u>one</u> of the following-

7-a.	How consensus is achieved?What are the steps,Explain.[CO4]	7
7-b.	How application interact with the ledger.[CO4]	7

8. Answer any <u>one</u> of the following-

8-a.	Explain mining principle behind bitcoin and ethereum.[CO5]	7

8-b.   What is the Ethereum network and how many Ethereum networks are you familiar   7
        with?[CO5]