BRAINWARE UNIVERSITY

Term End Examination 2024-2025
Programme – M.Sc.(ANCS)-2024
Course Name – Blockchain
Course Code - MNC20301B
(Semester II)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) Choose the purpose of Cryptography in a Blockchain network.

a) A digital currency
b) A distributed ledger technology
c) An online marketplace
d) A type of mobile app

(ii) Tell the role of the Genesis Block in a Blockchain network.

a) The first block in a Blockchain network
b) The most recently mined block in a Blockchain network
c) The block that contains the most number of transactions
d) The block that has the highest value of cryptocurrency

(iii) Indicate the feature of transactions for getting added to the Transaction Pool in a Blockchain network.

a) It is a centralized database system
b) It is based on relational database model
c) It is a decentralized database system
d) It is a distributed database system

(iv) How does the Grabbing of Valid Transactions by the Miner Class enhance the efficiency of a Blockchain network?

a) To encrypt the transaction data
b) To provide validation for the block
c) To mine new blocks
d) To create a digital signature

(v) How does the Miner Class in a Blockchain network aid in the validation of transactions?

a) The process of ensuring that there are multiple chains in the blockchain
b) The process of verifying that a block has multiple transactions
c) The process of checking if there are multiple copies of the blockchain and choosing the
d) The process of creating multiple copies of the blockchain for backup purposes.

correct one.

(vi) What does API stand for in Blockchain?

a) Application Price Index
b) Automated Protocol Interaction
c) Application Programming Interface
d) Applied Product Integration

(vii) Describe a Transaction Pool in the context of a Blockchain.

a) A situation where a miner controls more than 51% of the mining power in a Blockchain network
b) A situation where a hacker takes control of more than 51% of the nodes in a Blockchain network
c) A situation where a group of miners control more than 51% of the mining power in a Blockchain network
d) A situation where a group of hackers take control of more than 51% of the nodes in a Blockchain network

(viii) Discover the main advantage of using a Peer to Peer Server in a Blockchain network.

a) By allowing users to share their public keys
b) By allowing miners to validate transactions
c) By allowing users to encrypt transactions
d) By allowing users to decrypt transactions

(ix) What is the purpose of a smart contract in a blockchain project?

a) To facilitate transactions between different types of cryptocurrencies
b) To enable the creation of custom tokens on the blockchain
c) To automate the execution of contractual terms and conditions
d) FoTo verify the authenticity of the blockchain network

(x) Identify the primary advantage of using WebSocket over HTTPS.

a) Simplicity in implementation
b) Increased security
c) Full-duplex communication
d) Better SEO

(xi) Choose the purpose of the POST method in blockchain transactions

a) To retrieve existing transactions from the blockchain
b) To send new transactions to the network for validation
c) To delete invalid transactions
d) To modify existing blocks

(xii) Distinguish the following that is used to ensure consensus in a Permissionless Blockchain Environment

a) Proof of Authority (PoA)
b) Byzantine Fault Tolerance (BFT)
c) Proof of Work (PoW)
d) Practical Byzantine Fault Tolerance (PBFT)

(xiii) Correlate the concept to describe a P2P network in blockchain

a) A network where a central authority validates all transactions
b) A decentralized network where nodes communicate directly with each other
c) A client-server architecture for handling blockchain transactions
d) A network where only miners are allowed to communicate

(xiv) Select the primary function of the gossip protocol in blockchain P2P networks.

a) To encrypt blockchain data
b) To randomly distribute information among nodes
c) To prevent miners from validating transactions
d) To allow direct communication between two nodes only

(xv) Infer the most critical consequence of a successful 51% attack on a blockchain network.

a) The attacker can alter historical transactions and double-spend coins
b) The attacker can steal private keys from users' wallets
c) The entire blockchain is permanently deleted
d) The attacker gains control over all nodes in the network

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Explain the concept of nonce and its role in the mining process. (3)
3. How are transactions created with a wallet in blockchain technology? (3)
4. Apply the idea of synchronizing the blockchain across peers. (3)
5. Compare and contrast different cryptocurrencies based on their underlying blockchain technology. (3)
6. Analyze the significance of difficulty adjustment in blockchain technology. (3)

OR

Explain the role of miners in blockchain technology considering PoW consensus alogorithm. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. Explain the blockchain technology in your own words. (5)
8. What is a Merkle tree, and how does it enhance efficiency in blockchain transactions? (5)
9. Determine the challenges and risks associated with investing in cryptocurrencies. (5)
10. Consider on the energy consumption associated with Block chain and its sustainability solutions in environment. (5)
11. Explain the application of blockchain technology with a real-world example. (5)
12. Judge the wallet functions in the context of cryptocurrency. (5)

OR

Consider the different types of cryptocurrency wallets (hardware, software, and paper wallets), their functions, and the importance of securing private keys in this context. (5)

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