

NOC22-CS44: Blockchain and Its Applications

Assignment 8

Correct choices are highlighted in **Yellow**. Give partial marks for partially correct answers.

1. Which statement(s) are true about Byzantine Dissemination Quorum:

- a. 5
- b. 1
- c. 3**
- d. 15

Modification:

- i. Any 2 quorums have at least one correct replica in common
 - ii. Any 2 quorums have at most one correct replica in common
 - iii. If you have 3 numbers of faulty nodes you need at least 10 replicas to reach consensus.
 - iv. PBFT uses Byzantine Dissemination Quorum with $2f + 2$ replicas
- a. i, ii
 - b. ii, iv
 - c. Only iii**
 - d. Only iv

To reach consensus with f number of faulty nodes, you need at least $3f + 1$ replicas

2. Hyperledger Fabric only allows Proof of Work consensus to be plugged in to ensure a high degree of trustworthiness. True or False

- a. False**
- b. True

Hyperledger Fabric supports pluggable implementations of different components such as identity management, consensus algorithm etc to ensure confidentiality, resiliency and scalability.

3. Alice wants to interact with an Ethereum Network. Which of the following are required to do that?

- a. web3.js**
- b. nodejs
- c. geth**
- d. bitcoin

Refer to Lecture 36:

When a user wants to Interact with an Ethereum Network it is required to have a web app and a node with geth installed.

4. The command : geth --goerli --syncmode "fast" will
 - a. Will download all blocks excluding headers, transactions, and receipts and will generate the state of the blockchain incrementally by executing every block.
 - b. Will download all blocks including headers, transactions and receipts, will verify all headers, and download the state and verify it against the headers.
 - c. Will download all blocks including headers, transactions, and receipts and will generate the state of the blockchain incrementally by executing every block.
 - d. Will download all block headers, block data, and verifies some randomly.

Refer to Lecture 36:

Sync modes You can start Geth in one of three different sync modes using the syncmode "<mode>" argument that determines what sort of node it is in the network

5. Which of the following is an open, scalable consensus algorithm having low transaction throughput?
 - a. PoW
 - b. PoS
 - c. PBFT
 - d. PoB

Refer to Lecture 38

6. In a bitcoin network, the block size is 1.229MB and average transaction size is 729B. What is the transaction throughput value (transactions per second).

Ans(Fill in the blanks): 2.946

Block Size = 1MB

1MB = 1048576

Average Transaction Size = 380.04B

Number of Transaction per Block = Block Size/Average Transaction Size
= 1048576 / 380.04

Block Size = 1.229MB = 1288699.904 B

Transaction / sec = TPS = 1288699.904 / (729 * 600) = 2.946

7. Which of the following protocols ensure total ordering of transactions and consensus finality.
 - a. BFT
 - b. PoW
 - c. PoET
 - d. PoB

Refer to Lecture 38

8. Which statements are true about the Nakamoto Consensus?

- i. Provide transaction scalability
- ii. Prevents consensus finality
 - a. i, ii
 - b. i
 - c. ii
 - d. None of the above

Nakamoto Consensus or PoW is a randomised protocol which does not ensure consensus finality

9. In the CoSi Protocol, the second CoSi round to implement PBFT's which phase(s)?

You can choose multiple options if applicable.

- a. commit phase
- b. pre-prepare phase
- c. prepare phase
- d. learning phase

Refer to Lecture 40

One CoSi round to implement PBFT's pre prepare and prepare phases and second CoSi round to implement PBFT's commit phase

10. Running a chaincode in hyperledger fabric involves the following steps:

- i. Instantiation of Chaincode of Channel
- ii. Creation of Channel
- iii. Configuring Orderer and Peer nodes
- iv. Adding members to Channel
- v. Installing chaincode on peers

Which of the following sequence of steps is valid?

- a. ii, iv, iii, i, v
- b. iii, v, ii, iv, i
- c. ii, iv, iii, v, i
- d. iii, v, i, ii, iv

Refer to Lecture 35