

NOC23-CS44: Blockchain and Its Applications Assignment 8

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

1. Which of the following is/are true for Proof Of Work) PoW protocol

- a. Open environment
- b. Scalable
- c. Transaction Per second (TPS) is low in general in comparison to permissioned protocol
- d. None of the above

Detailed Solution: Please refer to slides. PoW works in an open environment with lots of nodes, scalable and slow in comparison to permissioned protocols in general. So the options a,b,c are true.

2. Which of the following is/are true for scalable witness cosigning protocol?

- a. protect authorities and their clients from undetected misuse
- b. ensuring that every authoritative statement is validated
- c. It can be used to sign a message by multiple authorities collectively
- d. none of the above

Detailed Solution: cosigning protocol supports collective signing and publicly logging them by witnesses. So the options a,b,c are true. For details, please refer to the slides.

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

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

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

4. 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

Detailed Solution:: 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.

5. 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.

Detailed Solution: 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

6. Which of the following is an open, scalable consensus algorithm having low transaction throughput?

- a. PoW
- b. PoS
- c. PBFT
- d. PoB

Detailed Solution: Refer to Lecture 38

7. In basic form PBFT has higher transaction throughput than PoW
- a. False
 - b. True

Detailed Solution: PBFT works in closed environments and is faster.

8. Which of the below statements is true?
- a. PoW is a non-randomized protocol

b. BFT protocols ensure total ordering of transactions

c. PoW can always ensure consensus finality

d. None of the above

Detailed Solution: PoW is randomized and need not ensure finality. For details, please refer to the slide.

9. BFT protocol ensures finality in general.

a. False

b. True

Detailed Solution: BFT protocols commit blocks based on transaction ordering and ensure finality. For details, please refer to the slide.

10. Hyperledger Fabric allows pluggable implementations of consensus algorithm to ensure a high degree of confidentiality, resiliency and scalability. True or False

a. False

b. True

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