1. What is the task of miners in a blockchain network?

A) Miners act as a single third party to aggregate records and provide trust in the network by the miners' authority.

B) Miners are computers that allow access to the blockchain, ensuring the number of corrupt nodes will stay low.

C) **Miners are nodes that compete for a reward by calculating the correct nonce to make a transaction possible.**

D) Miners determine the consensus rules that should be followed and interfere when these rules are broken

2. What is an advantage of a public blockchain?

A) It does not use disinterested third parties to secure blocks, as all participants have a vested interest.

B) It is more resilient against fraud because it uses federated nodes to combat fraud.

C) **It is open to everyone in the world without permission and licensing requirements.**

D) Its networks are built by for-profit companies and the working of the network is guaranteed.

3. How do blockchains use private and public-key cryptography?

A) **Asymmetric encryption allows a sender to transfer cryptocurrency to a public key. The recipient can then access these funds with their private key and hold it in their wallet.**

B) In public-key cryptography, one key is used to encrypt and decrypt transactions. The sender uses this key to send cryptocurrency and the recipient's wallet holds it after decryption.

C) Symmetric encryption allows a sender to transfer cryptocurrency to another user. The recipient can then access their funds when the sender grants access to their private key.

D) The algorithm in the blockchain encrypts and stores private and public keys to all user's wallets. The user then accesses their funds through their twenty-word passphrase key

4. A competitive consensus algorithm was developed because blockchains had difficulty meeting the transaction speed demands. Which consensus algorithm is this?

A.   Delegated Proof of Stake (DPoS)
B.   Proof of Burn
C.   **Proof of Stake (PoS)**
D.   Proof of Work (PoW)

5. What is the value of using blockchain networks with the Internet of Things (IoT)?

A. Allowing blockchain users to follow self-driving cars and access these cars

C. Enabling software that programs itself to solve problems without human intervention

B. Avoiding a spoofing attack using the secured identity that is stored on a blockchain

D. Solving expensive and complex calculations using Hyperledger Fabric mining

6. How does blockchain technology help to protect intellectual property rights (IP)?

A.   It allows a user to include IP transactions in smart contracts.
B.   **It allows a user to record an event and establish the timeline.**
C.   It allows a user to record the creation of software packages.
D.   It allows a user to send a transaction and receive IP ownership.

7. What is the role of a DAO (decentralized autonomous organization)?

A)   **Address the principal-agent dilemma with collaboration and acceptance of actions within agreed rules**

B)   Embed regulated online smart contracts with the current judicial system, using public blockchains

C)   Offer complex online smart contracts without any link to tangible and intangible offline assets

D)   Provide a private blockchain contract platform on which users can run their online applications

8. What does P2P stand for?

    A. Password to Password

    B. Product to Product

    C. Peer to Peer

    D. Private Key to Public Key

9. What is a node?

    A. A type of cryptocurrency
    B. An exchange
    C. A Blockchain
    D. A computer on a Blockchain network

10. What is a blockchain?

A)   A centralized database that holds a subset of all transactions on all nodes.

B)   A client-server database existing on a limited number of nodes at the same time.

C)   **A distributed database with a record of all transactions on the network.**

D)   A standalone database with history of all transactions on various nodes.

11. What is digital fiat currency?

    A. A digital form of currency, that represents a country's financial reserves

    B. An e-currency, that creates a transparent and borderless debtmarket

    C. An online system, that enables making transactions without a bankaccount

    D. Same as cryptocurrency

12. The term used for blockchain splits is?

    A. fork

    B. division

    C. merger

    D. None of the above

13. What is a miner?

A. A person doing calculations to verify a transaction

B. Computers that validate and process blockchain transactions

C. A type of blockchain

D. An algorithm that predicts the next part of the chain

14. Bitcoin is created by _____

A. Saifedian Ammous

B. Bill Buterin

C. Satoshi Nakamoto

D. None of the above

15. What is the purpose of a nonce?

A. A hash functions

B. Sends information to the blockchain

Follows nouns

C. Prevents double-spending network

16. A bearer instrument used to transfer value between two parties over a blockchain network?

A. A DApp
B. A Hash

C. A Node
D. A Token

17. An attacker tries to corrupt the transaction history of a blockchain to be able to spend a token or a cryptocurrency twice? What is the most likely thing this attacker did?

A. The attacker changed the transaction on his node and propagated it in the network
B. The attacker edited the smart contract and recovered the investor's cryptocurrency

C. The attacker gained control of more than 51% of the network's computing power

D. The attacker hard-forked the network and created a new blockchain network

18. How does blockchain improve supply chains?

A)   By automatically creating trade agreements between two parties
B)   By creating safe centralized marketplaces to trade goods on
C)   By stabilizing the national currencies of the countries involved
D)   **By transferring tokenized ownership through a software system**

19. What is a benefit of a decentralized marketplace?

A)   It is based on open-source technology, so it can be used without any investment.
B)   It is not under a paid license to operate and therefore it is managed better.
C)   It is relatively cheap due to the use of cryptocurrency and is very accessible.

D)   **It is tamper-proof, resilient to being shut down, and trustworthy due to smart contracts.**

20. How can blockchain technology **best** help securing identity data?

A)   By eliminating third parties through providing secured-data storage at a user's server

B)   By encoding all the health data and save it on a private and permissionless blockchain

C)   By protecting data that has been submitted on the internet using a cryptographic algorithm

D)   **By providing information personal data without disclosing the actual data that proves it**

21. What are DApps designed to do?

A)   Execute smart contracts with the business logic in the front-end of a standalone application

B)   Manage cryptocurrencies only, without any embedded voting system for governance of theblockchain

C)   **Run applications on a peer-to-peer (P2P) network expanding smart contracts beyond simplevalue transfer**

D)   Support applications that run on multiple public cloud providers avoiding any vendor lock-inand fraud

22. In which scenario is a smart contract the **best** solution to the problem?

A)   A bartender wants to force customers to pay for their drinks by transferring cryptocurrency to hiswallet.

B)   A chief financial officer wants her smart watch to notify her when her partner enters their frontdoor.

C)   **An energy company wants to automatically buy power when the price reaches a predetermined rate.**

D)   An insurance company wants to pay out a farmer whenever the case manager feels it is best to doso.

23. What is the best use case for smart contracts?

A)   Digitalize and automate legally binding contracts using artificial intelligence (AI)

B)   Enforce the execution of contracts in the legal system using cryptocurrencies

C)   **Ensure automatic payments by predetermined actions or events in insurance contracts**

D)   Extend the Bitcoin blockchain, the best-known smart contract platform, to the judicial system

24. What is a **key** characteristic of the Hyperledger network?

A)   It is a public blockchain network and one of the oldest networks, existing since 2009.

B)   **It is private, open-sourced, and can run everyone's own distributed ledger technology (DLT).**

C)   It utilizes cryptocurrency as a reward mechanism, which makes the network more secure.

D)   It utilizes the Proof of Stake (PoS) consensus algorithm as its main security measure.

25. Public blockchains give an incentive to encourage users to mine blocks and secure the network. What incentive is this?

A)   Public blockchains allow users to create tokens to sell on secondary markets.

B)   Public blockchains do not offer rewards, because they are open source.

C)   Public blockchains offer cash rewards for running mining nodes.

D)   **Public blockchains offer rewards for mining in the form of cryptocurrency.**

26. Blockchain enables self-sovereign identity. How does blockchain do this?

A)   It enables centralized third parties to offer easy-to-use and valid identity information.

B)   **It enables each person to have exclusive control of their money, property, and identity.**

C)   It enables governments to effortlessly issue identities with advanced digital certificates.

D)   It enables only internet companies to offer world-class secure personal identity repositories.

27. In what way do blockchains use a public witness?

A)   A digital courthouse or library acts as a public witness to store information to reference.

B)   **A node on a blockchain network attests to the accuracy and truthfulness of the information.**

C)   A person sends a transaction over a public network to earn rewards as a public witness.

D)   A preferred node can be elected to attest to the accuracy and truthfulness of the information.

28. How can information be secured in a blockchain?

A)   By using a closed peer-to-peer (P2P) network, sharing information across platforms

B)   By using a distribution of cryptocurrencies over miners through the network

C)   **By using asymmetric cryptography, consisting of a public and private key**

D)   By using distributed ledger technology (DLT), which records transactions at the source

29. How do fraudsters use a Ponzi scheme?

A)   A fraudster convinces a victim to pay for receiving something of greater value later on.

B)   A fraudster finds investors, then dumps the tokens of the investors to crash the market.

C)   **A fraudster pays dividends to initial investors using the funds of subsequent investors.**

D)   A fraudster steals credit cards and uses them to buy money, goods or property.

30. An attacker tries to corrupt the transaction history of a blockchain to be able to spend a token or acryptocurrency twice. What is the **most** likely thing this attacker did?

A)   The attacker changed the transaction on his node and propagated it in the network.

B)   The attacker edited the smart contract and recovered investor's cryptocurrency.

C)   **The attacker gained control of more than 51% of the network's computing power.**

D)   The attacker hard-forked the network and created a new blockchain network.

31. What is an advantage of using the consensus algorithm Proof of Elapsed Time (PoET) instead of Proof of Work (PoW)?

A)   PoET can often be used in a permissionless blockchain more easily than PoW because PoET's lottery system for node selection is secure.

B)   PoET has generally lower transaction costs than PoW, because the hardware needed is more generic than the hardware needed for PoW.

C)   PoET is much more secure than PoW, because PoET supports the trusted execution environment (TEE) by time-stamping the transactions.

D)   **PoET is usually faster than PoW, because fewer nodes compete for validation than in PoW since PoET randomly selects the nodes**

32. Which consensus algorithm is the **least** energy efficient?

A)   Delegated Proof of Stake (DPoS)
B)   Proof of Authority (PoA)
C)   Proof of Space (PoSpace)
D)   **Proof of Work (PoW)**

33. Which description fits **only** the Proof of Work (PoW) consensus algorithm?

A.   A collaborative consensus algorithm, where approved accounts do the validation.

B.   A collaborative consensus algorithm that is facilitated by farmers, who offer leftover memory of their computer to make transactions possible.

C.   A consensus algorithm, where the validation is done for the entire transaction flow, including not only the correctness but also the sequence of transactions.

D.   **An intensive and expensive, competitive algorithm where each mining node on the blockchain is competing to secure blocks.**

34. How do hybrid blockchain networks combat 51% attacks?

A. Through a central controller ensuring the security of each node in the network
B. Through a Proof of Work (PoW) algorithm, which allows miners to secure the network
C. Through incentivization, where miners receive currency for securing the network
D. **Through Merkle tree roots, that allow the network to restore itself to its last valid block**

35. What is **not** a classification for a node?

A) Full node
B) Lightweight node
C) **Merkle node**
D) Miner node

Unit 1: Introduction

1. What is Byzantine Generals problem and Explain how to achieveFault Tolerance.

2. Explain block Chain Technology with its advantages and real timeExamples.

3. Construct with the example-two generals' problem.

4. With neat diagram explain Hadoop Distributed File System.

5. What is Distributed Hash Table, explain in detail.

6. What is ASIC resistance and arguments against it.

7. Write a short note on.

    I.   Distributed Database

8. What is Zero Knowledge proof; explain in detail with neat diagram.

9. Write a note on Cryptography: Hash function.

10. What is Memory hard algorithm why it is used in blockchain.

11. What is Turing Complete and explain components of Ethereum Turing-complete virtual machine.

12. Write a short note on.

    ii)   Digital Signature
    iii)   Scrypt algorithm

Unit 2: Blockchain

13. Explain Advantage of blockchain over conventional distributeddatabase.

14. With a neat diagram explain Blockchain Network in detail.

15. What are Mining Mechanisms available in blockchain.

16. Explain Mining Mechanism with its type

17. List various Distributed Consensus mechanisms available in blockchain.

18. Write a short note on.

    i.   Merkle Patricia Tree

    ii.   Gas Limit

19. Write the difference between Private and Public blockchain.

20. Explain fork in block Chain Technology.Compare Soft and Hard Fork in Block Chain.

21. Explain with near diagram Life cycle of Blockchain application.

22. What is Transactions in blockchain explain in detail and what is Fees for transaction .

23. Write a short note on.

    i.   Anonymity

    ii.   Reward

Unit 3: Distributed Consensus

24. With a neat diagram Explain Nakamoto consensus/ Proof of Workconsensus in detail.

25. How Proof of Stake consensus mechanism works in blockchain.

26. Explain Sybil Attack in blockchain, what are different prevention mechanisms.

27. What are the different alternate available for reaching consensus in blockchain.

28. Analyse Proof of Work &Proof of Stack in detail with example

29. Write a short note on.

    i.   Difficulty Level
    ii.   Energy utilization
    iii.   Proof of burn

Unit 4: Cryptocurrency

30. Explain in brief history of blockchain.

31. Illustrate different types of Attacks

32. How the distributed ledger technology works in case of blockchain.

33. What are different bitcoin protocols and why SegWit is introduced in blockchain.

34. Explain history of cryptocurrency& Distributed Ledger in detail

35. What are the different strategic considerations for the miner before picking a block to work on.

36. Write a short note with diagram.

    i.   Forking Attack

    ii.   Temporary block withholding attack

37. Explain Ethereum ecosystem in detail.

38. What is DAO, explain The DAO and associated bug.

39. Explain Smart contract and smart contract properties.

40. What is GHOST protocol and how does it work.

41. Explain in detail Sidechain.

42. Write a short note with diagram.

    i   Attacks and Vulnerabilities in cryptocurrency

Unit 5: Cryptocurrency Regulation

43. Who are the stakeholders for the cryptocurrency / cryptocurrencyregulation, explain in detail.

44. What is Stakeholders? Analyze different Layers of Stakeholders

45. Explain Roots of Bit coin and the growth of bitcoin.

46. Define different Leagal Aspects of cryptocurrency
47. What is Crypto currency exchange mention the legal aspectassociated with it.

48. What is Black market and how does it work.

49. Write a short note with diagram.

   • Black market and Global economy

Unit 6: Cryptocurrency Applications

50. What are the benefits of Benefits of IoT and blockchain convergence

51. Explain Internet of Things in block chain

52. Analyze Medical Record Management System in Block chain

53. Explain blockchain-based IOT model, with neat diagram.

54. How blockchain can be used for providing Domain Name Service.

55. Write a short note with diagram.

   • future of Blockchain