1. What does the MAC sublayer primarily handle in a network?

a) Physical transmission of data
b) Medium Access Control
c) Data link layer encryption
d) Network routing

Answer: b) Medium Access Control

Explanation: The MAC sublayer is responsible for controlling access to the network medium, ensuring that multiple devices can share the same physical medium efficiently.

2. Which algorithm is used by the MAC sublayer for collision avoidance in Ethernet networks?

a) Binary Exponential Back-off (BEB)
b) Binary Count Down
c) Adaptive Tree Walk
d) Basic Bit Map

Answer: a) Binary Exponential Back-off (BEB)

Explanation: BEB algorithm is utilized by the MAC sublayer to handle collisions in Ethernet networks by exponentially increasing the back-off time for retransmissions.

3. Which of the following is an example of a Distributed Random Access Scheme?

a) ALOHA
b) Binary Count Down

c) MLMA
d) BRAP

Answer: a) ALOHA

Explanation: ALOHA is a classic example of a Distributed Random Access Scheme used for data services, allowing multiple users to transmit data over a shared medium.

4. Which protocol is known for its use of “carrier sensing” to avoid collisions in Local-Area Networks?

a) CSMA/CD
b) Slotted ALOHA
c) Binary Count Down
d) Adaptive Tree Walk

Answer: a) CSMA/CD

Explanation: Carrier Sense Multiple Access with Collision Detection (CSMA/CD) is a protocol used in Ethernet networks. It involves sensing the carrier (medium) to detect any ongoing transmissions before initiating transmissions to avoid collisions.

5. Which protocol is used in wireless LANs and involves avoiding collisions by listening to the medium before transmitting?

a) CSMA/CD
b) CSMA/CA
c) ALOHA

d) Slotted ALOHA

Answer: b) CSMA/CA

Explanation: Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA) is used in wireless LANs, where devices listen to the medium to avoid collisions before transmitting data.

6. Which protocol is known for dividing time into discrete slots to regulate transmissions in a contention-based network?

a) ALOHA
b) Slotted ALOHA
c) CSMA/CD
d) CSMA/CA

Answer: b) Slotted ALOHA

Explanation: Slotted ALOHA divides time into fixed slots, allowing devices to transmit only at the beginning of each time slot, which helps in regulating transmissions and avoiding collisions.

7. Which collision-free protocol utilizes a bitmap to manage available slots for transmissions?

a) Basic Bit Map
b) BRAP
c) Binary Count Down
d) MLMA

Answer: a) Basic Bit Map

Explanation: Basic Bit Map protocol employs a bitmap to indicate the availability of time slots for transmissions, thus ensuring collision-free communication in contention-based networks.

8. Which Limited Contention Protocol utilizes a tree-based algorithm to allocate slots for transmissions?

a) Adaptive Tree Walk
b) Binary Count Down
c) BRAP
d) MLMA

Answer: a) Adaptive Tree Walk

Explanation: Adaptive Tree Walk is a Limited Contention Protocol that employs a tree-based algorithm to allocate transmission slots efficiently, particularly in scenarios with limited contention.

9. What IEEE standard defines the operation of Ethernet LANs and is widely used for wired LANs?

a) 802.11
b) 802.3
c) 802.16
d) 802.1

Answer: b) 802.3

Explanation: IEEE 802.3 standard defines the operation of Ethernet LANs, specifying the physical and data link layer requirements for wired LAN communication.

10. Which IEEE standard is associated with wireless LANs, commonly known as Wi-Fi?

a) 802.3
b) 802.11
c) 802.16
d) 802.1

Answer: b) 802.11

Explanation: IEEE 802.11 standard governs the operation of wireless LANs, commonly referred to as Wi-Fi, providing specifications for wireless communication protocols.

11. Which IEEE standard defines the operation of WiMAX, a technology used for long-range wireless communication?

a) 802.3
b) 802.11
c) 802.16
d) 802.1

Answer: c) 802.16

Explanation: IEEE 802.16 standard specifies the operation of WiMAX technology, which is used for long-range wireless communication, particularly in metropolitan area networks (MANs).

12. What does CSMA stand for in networking?

a) Collision Sensing Multiple Access
b) Carrier Sensing Multiple Access
c) Collision Avoidance Multiple Access
d) Carrier Avoidance Multiple Access

Answer: b) Carrier Sensing Multiple Access

Explanation: CSMA stands for Carrier Sensing Multiple Access, a protocol used in networks to avoid collisions by sensing the carrier (medium) before transmitting data.

13. In which protocol does each node contend for access to the medium with a probability of transmission that is inversely proportional to the number of active nodes?

a) ALOHA
b) Slotted ALOHA
c) CSMA
d) CSMA/CA

Answer: a) ALOHA

Explanation: In ALOHA, each node contends for access to the medium with a probability of transmission that is inversely proportional to the number of active nodes, thereby regulating access in contention-based networks.

14. Which of the following is NOT a performance measuring metric in networking?

a) Throughput
b) Latency
c) Packet Loss
d) Medium Access Control

Answer: d) Medium Access Control

Explanation: Medium Access Control (MAC) is a component of the data link layer, not a performance measuring metric. Throughput, latency, and packet loss are common metrics used to evaluate network performance.

15. Which IEEE standard is associated with Ethernet over twisted pair wiring in LANs?

a) 802.3
b) 802.11
c) 802.16
d) 802.1

Answer: a) 802.3

Explanation: IEEE 802.3 standard defines the operation of Ethernet LANs, including specifications for Ethernet over twisted pair wiring commonly used in LAN deployments.

16. What is the purpose of the Binary Exponential Back-off (BEB) algorithm in network protocols?

a) To prioritize certain types of data packets
b) To regulate access to the network medium and handle collisions

c) To encrypt data before transmission
d) To route data packets to their destinations

Answer: b) To regulate access to the network medium and handle collisions

Explanation: The Binary Exponential Back-off (BEB) algorithm is used in network protocols to regulate access to the network medium and handle collisions efficiently by adjusting retransmission attempts.

17. Which contention scheme divides time into discrete slots and requires devices to wait for the beginning of a slot before transmitting?

a) CSMA
b) CSMA/CD
c) Slotted ALOHA
d) ALOHA

Answer: c) Slotted ALOHA

Explanation: Slotted ALOHA divides time into fixed slots, requiring devices to wait for the beginning of a slot before transmitting data, thus reducing the probability of collisions.

18. Which IEEE standard specifies the operation of wireless personal area networks (WPANs)?

a) 802.3
b) 802.11
c) 802.15
d) 802.16

Answer: c) 802.15

Explanation: IEEE 802.15 standard defines the operation of wireless personal area networks (WPANs), including specifications for protocols such as Bluetooth.

19. What is the primary function of CSMA/CA in wireless networks?

a) To detect collisions
b) To handle retransmissions after collisions
c) To avoid collisions by sensing the medium before transmitting
d) To prioritize certain types of data packets

Answer: c) To avoid collisions by sensing the medium before transmitting

Explanation: Carrier Sense Multiple Access with Collision Avoidance (CSMA/CA) is used in wireless networks to avoid collisions by sensing the medium before initiating transmissions, thereby improving efficiency.

20. Which IEEE standard is associated with network bridging and VLANs?

a) 802.1
b) 802.3
c) 802.11
d) 802.16

Answer: a) 802.1

Explanation: IEEE 802.1 standard specifies protocols for network bridging, VLANs (Virtual

LANs), and other functions related to network management and control.

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