Unit-III

1. The Network Layer is the _____ layer of the OSI model.

A) First
B) Second
C) Third
D) Fourth
Answer: C) Third

2. The primary function of the Network Layer is:

A) Framing
B) Routing
C) Encryption
D) Error Detection
Answer: B) Routing

3. The process of moving packets from source to destination is called:

A) Multiplexing
B) Routing
C) Encoding
D) Modulation
Answer: B) Routing

4. Forwarding refers to:

A) Selecting the best path
B) Moving packets from input port to output port
C) Error correction
D) Flow control
Answer: B) Moving packets from input port to output port

5. Which device mainly operates at the Network Layer?

A) Hub
B) Switch
C) Router
D) Repeater
Answer: C) Router

6. A Network Service Model defines:

A) Physical transmission medium
B) Services provided to the transport layer
C) MAC addressing
D) Frame format
Answer: B) Services provided to the transport layer

7. Which network type establishes a path before data transfer?

A) Datagram Network
B) Virtual Circuit Network
C) Broadcast Network
D) Wireless Network
Answer: B) Virtual Circuit Network

8. In a Virtual Circuit network, all packets follow:

A) Different paths
B) Random paths
C) The same path
D) No path
Answer: C) The same path

9. The Internet is based on:

A) Virtual Circuit Network
B) Datagram Network
C) Circuit Switching
D) Packet Broadcasting
Answer: B) Datagram Network

10. In a Datagram network:

A) A dedicated path is established
B) Packets may take different routes
C) No addressing is required
D) Packets are transmitted as frames only
Answer: B) Packets may take different routes

11. Which component performs packet forwarding?

A) Modem
B) Router
C) Hub
D) Repeater
Answer: B) Router

12. The process of examining incoming packets is called:

A) Switching
B) Routing
C) Input Processing
D) Fragmentation
Answer: C) Input Processing

13. Router output queues are used when:

A) Packets arrive slowly
B) Packets leave faster than arrival
C) Arrival rate exceeds transmission rate
D) No traffic exists
Answer: C) Arrival rate exceeds transmission rate

14. The routing control plane is responsible for:

A) Frame checking
B) Path determination
C) Error correction
D) Multiplexing
Answer: B) Path determination

15. IP stands for:

A) Internet Process
B) Internal Protocol
C) Internet Protocol
D) Internet Packet
Answer: C) Internet Protocol

16. The Internet Protocol works at the:

A) Application Layer
B) Transport Layer
C) Network Layer
D) Data Link Layer
Answer: C) Network Layer

17. The basic unit of data at the IP layer is called:

A) Frame
B) Segment
C) Datagram
D) Packet Cell
Answer: C) Datagram

18. IPv4 address length is:

A) 16 bits
B) 32 bits
C) 64 bits
D) 128 bits
Answer: B) 32 bits

19. IPv6 address length is:

A) 32 bits
B) 64 bits
C) 128 bits
D) 256 bits
Answer: C) 128 bits

20. Which protocol reports network errors and diagnostics?

A) TCP
B) UDP
C) ICMP
D) ARP
Answer: C) ICMP

21. ICMP stands for:

A) Internet Communication Management Protocol
B) Internet Control Message Protocol
C) Internal Control Message Protocol
D) Internet Connection Message Protocol
Answer: B) Internet Control Message Protocol

22. The "Ping" utility uses:

A) TCP
B) UDP
C) ICMP
D) ARP
Answer: C) ICMP

23. Which field in an IPv4 packet prevents endless circulation?

A) Length
B) Header Checksum
C) TTL
D) Version
Answer: C) TTL

24. TTL stands for:

A) Total Time Limit
B) Time To Live
C) Transmission Time Limit
D) Temporary Time Level
Answer: B) Time To Live

25. Which version field identifies IPv4 packets?

A) Version
B) Length
C) Protocol
D) TTL
Answer: A) Version

26. Which protocol carries user data over the Internet?

A) IP
B) ICMP
C) ARP
D) DNS
Answer: A) IP

27. IPv6 was introduced mainly because:

A) IPv4 was too slow
B) IPv4 address exhaustion
C) Routers failed
D) Ethernet limitations
Answer: B) IPv4 address exhaustion

28. Which address format is used in IPv6?

A) Decimal notation
B) Binary notation only
C) Hexadecimal notation
D) Octal notation
Answer: C) Hexadecimal notation

29. Routing and forwarding are functions of the:

A) Physical Layer
B) Data Link Layer
C) Network Layer
D) Application Layer
Answer: C) Network Layer

30. A router mainly connects:

A) Computers only
B) Networks
C) Printers
D) Sensors only
Answer: B) Networks

Fill in the Blanks

1. The Network Layer is the _____ layer of the OSI model.
   Answer: Third
2. The main function of the Network Layer is _____.
   Answer: Routing
3. The process of transferring packets to the correct output port is called _____.
   Answer: Forwarding
4. A _____ selects the best path between networks.
   Answer: Router
5. A Virtual Circuit network establishes a _____ before data transfer.
   Answer: Connection
6. In a Virtual Circuit network, all packets follow the _____ route.
   Answer: Same
7. The Internet uses a _____ network architecture.
   Answer: Datagram
8. In a Datagram network, packets may take _____ paths.
   Answer: Different
9. The process of checking incoming packets is called _____ processing.
   Answer: Input
10. Packet transfer within a router is called _____.
    Answer: Switching
11. Output queues store packets before _____.
    Answer: Transmission
12. The routing control plane determines packet _____.
    Answer: Routes
13. IP stands for Internet _____.
    Answer: Protocol
14. The data unit at the Network Layer is called a _____.
    Answer: Datagram
15. IPv4 addresses are _____ bits long.
    Answer: 32
16. IPv6 addresses are _____ bits long.
    Answer: 128
17. IPv4 uses dotted _____ notation.
    Answer: Decimal
18. IPv6 addresses are represented in _____ notation.
    Answer: Hexadecimal
19. ICMP stands for Internet Control _____ Protocol.
    Answer: Message
20. ICMP is used for error reporting and _____.
    Answer: Diagnostics
21. The Ping command uses the _____ protocol.
    Answer: ICMP

22. TTL stands for Time To _____.
Answer: Live
23. TTL prevents packets from circulating _____.
Answer: Forever
24. Routers operate mainly at the _____ layer.
Answer: Network
25. The IPv4 header contains a _____ field.
Answer: Version
26. The source and destination IP addresses are found in the IP _____.
Answer: Header
27. IPv6 was developed to solve IPv4 address _____.
Answer: Exhaustion
28. Routing tables are maintained by _____.
Answer: Routers
29. Forwarding is a _____ plane function.
Answer: Data
30. Routing is a _____ plane function.
Answer: Control
31. Network Layer protocols provide logical _____.
Answer: Addressing
32. The IPv4 datagram contains both header and _____.
Answer: Data
33. A router connects multiple _____.
Answer: Networks
34. The Internet Protocol is a _____ layer protocol.
Answer: Network
35. The destination address identifies the packet's final _____.
Answer: Receiver/User/System