

# Network Fundamentals & OSI Model

Total:30 marks

Time:30 min

1. What is the fundamental role of a Router in a network?
    - A) To filter network traffic based on MAC addresses.
    - B) To forward data packets between different networks (subnets).
    - C) To connect all devices within a single local segment.
    - D) To translate domain names to IP addresses.
  2. Which OSI layer is responsible for logical addressing (IP addressing)?
    - A) Data Link Layer
    - B) Transport Layer
    - C) Network Layer
    - D) Physical Layer
  3. Which device operates primarily at Layer 2 (Data Link Layer) of the OSI model and forwards frames based on MAC addresses?
    - A) Router
    - B) Hub
    - C) Switch
    - D) Firewall
  4. How many layers are in the OSI (Open Systems Interconnection) reference model?
    - A) 4
    - B) 5
    - C) 7
    - D) 8
  5. What is the primary function of the Physical Layer?
    - A) Segmenting data into smaller pieces.
    - B) Providing end-to-end communication.
    - C) Converting data into a format understandable by the application.
    - D) Transmitting and receiving raw bit streams over a physical medium.
  6. Which layer of the OSI model ensures reliable, connection-oriented data delivery?
    - A) Session Layer
    - B) Transport Layer
    - C) Presentation Layer
    - D) Application Layer
  7. What is the standard MAC address length?
    - A) 32 bits
    - B) 48 bits
    - C) 64 bits
    - D) 128 bits
- TCP/IP and Protocols
8. Which protocol is known for being connectionless and providing unreliable transport service?

- A) TCP (Transmission Control Protocol)
- B) FTP (File Transfer Protocol)
- C) UDP (User Datagram Protocol)
- D) HTTP (HyperText Transfer Protocol)

9. What is the default port number used by the HTTP protocol?

- A) 21
- B) 23
- C) 80
- D) 443

10. What is the purpose of the ARP (Address Resolution Protocol)?

- A) To resolve a Domain Name (URL) to an IP address.
- B) To resolve an IP address to a MAC address.
- C) To assign IP addresses dynamically.
- D) To manage network devices.

11. Which protocol is used to automatically assign IP addresses, subnet masks, and other network parameters to client devices?

- A) DNS (Domain Name System)
- B) SMTP (Simple Mail Transfer Protocol)
- C) DHCP (Dynamic Host Configuration Protocol)
- D) ICMP (Internet Control Message Protocol)

12. Which protocol is used for secure remote command-line login and management?

- A) Telnet
- B) FTP
- C) SSH (Secure Shell)
- D) SNMP

13. In the TCP/IP stack, the Internet Layer is equivalent to which layer(s) of the OSI model?

- A) Transport Layer
- B) Network Layer
- C) Data Link and Physical Layers
- D) Application Layer

14. Which layer of the TCP/IP model is responsible for framing and media access?

- A) Application
- B) Internet
- C) Transport
- D) Network Access

IP Addressing and Subnetting

15. What is the dotted-decimal representation of the Class C default subnet mask?

- A) 255.0.0.0
- B) 255.255.0.0
- C) 255.255.255.0
- D) 255.255.255.255

16. Which of the following is a private IP address range?

- A) 1.0.0.0 – 1.255.255.255
- B) 192.168.0.0 – 192.168.255.255

C) 224.0.0.0 – 239.255.255.255

D) 172.32.0.0 – 172.64.255.255

17. The subnet mask /24 in CIDR notation is equivalent to which dotted-decimal mask?

A) 255.255.0.0

B) 255.0.0.0

C) 255.255.255.128

D) 255.255.255.0

18. What is the loopback address commonly used for testing the TCP/IP stack on a local machine?

A) 1.1.1.1

B) 8.8.8.8

C) 192.168.1.1

D) 127.0.0.1

19. How long is an IPv6 address?

A) 32 bits

B) 48 bits

C) 64 bits

D) 128 bits

20. In an IP network, what is the address where all the host bits are set to '0'?

A) Broadcast Address

B) Default Gateway

C) Network Address

D) Loopback Address

21. A CIDR prefix of /26 allows for how many usable host IP addresses?

A) 30

B) 62

C) 126

D) 254

Cisco IOS and Basic Commands

22. Which Cisco IOS mode allows you to view the running configuration and perform basic testing, but not make any configuration changes?

A) Global Configuration Mode

B) User EXEC Mode (or Standard User Mode)

C) Privileged EXEC Mode

D) Interface Configuration Mode

23. Which command is used to save the running configuration to the Non-Volatile RAM (NVRAM) on a Cisco device?

A) show running-config

B) reload

C) copy tftp flash

D) copy running-config startup-config (or wr for short)

24. What command would you use to enter global configuration mode from privileged EXEC mode?

A) interface fastethernet 0/1

- B) exit
- C) configure terminal
- D) enable

25. Which command displays the IP configuration of all interfaces on a Cisco device?

- A) show interfaces
- B) show ip interface brief
- C) show version
- D) show startup-config

#### Networking Concepts

26. What term describes a logical grouping of network devices that isolates traffic and reduces the size of the broadcast domain?

- A) VLAN (Virtual Local Area Network)
- B) WAN
- C) VPN
- D) DMZ

27. What is the term for the loss of signal strength as it travels through a medium?

- A) Latency
- B) Throughput
- C) Attenuation
- D) Jitter

28. Which type of network cable is immune to EMI (Electromagnetic Interference)?

- A) Coaxial
- B) Unshielded Twisted Pair (UTP)
- C) Shielded Twisted Pair (STP)
- D) Fiber Optic

29. What is the purpose of NAT (Network Address Translation)?

- A) To translate hostnames to IP addresses.
- B) To secure wireless connections.
- C) To translate private IP addresses to a public IP address (and vice-versa).
- D) To dynamically assign IP addresses.

30. Which term is used for the network security mechanism that allows or denies traffic based on a defined set of rules, often deployed on routers and firewalls?

- A) ACL (Access Control List)
- B) NAT
- C) DHCP
- D) STP