Basic Networking Concepts

Q1: What is a **network**?
A1: A network is a collection of interconnected devices (such as computers, servers, and routers) that communicate with each other to share resources and information.

Q2: What is an **IP address**?
A2: An IP address (Internet Protocol address) is a unique numerical label assigned to each device on a network that identifies and enables communication between them.

Q3: What is the difference between **IPv4 and IPv6**?
A3: IPv4 uses a 32-bit address format and supports about 4.3 billion addresses, whereas IPv6 uses a 128-bit address format, allowing for a significantly larger number of unique addresses.

Network Devices

Q4: What is a **router**?
A4: A router is a device that forwards data packets between different networks and directs traffic based on IP addresses.

Q5: What is a **switch**?
A5: A switch is a network device that connects multiple devices within a local network (LAN) and forwards data based on MAC addresses.

Q6: What is a **modem**?
A6: A modem (modulator-demodulator) is a device that converts digital data into signals for transmission over telephone or cable lines and vice versa.

Network Protocols

Q7: What is **DNS (Domain Name System)?**
A7: DNS translates human-readable domain names (e.g., www.google.com) into IP addresses that computers use to identify each other on the internet.

Q8: What is **DHCP (Dynamic Host Configuration Protocol)?**
A8: DHCP is a protocol that automatically assigns IP addresses and other network configurations to devices on a network.

Q9: What is **HTTP vs. HTTPS**?
A9: HTTP (Hypertext Transfer Protocol) is used for transmitting web pages, while HTTPS (HTTP Secure) adds encryption using SSL/TLS for secure communication.

Networking Models & Layers

Q10: What is the **OSI model**?
A10: The OSI (Open Systems Interconnection) model is a conceptual framework that standardizes networking functions into seven layers: Physical, Data Link, Network, Transport, Session, Presentation, and Application.

Q11: What is the **TCP/IP model**?
A11: The TCP/IP model is a four-layer networking framework consisting of the Network Interface, Internet, Transport, and Application layers, used to standardize internet communication.

Q12: What is the difference between **TCP and UDP**?
A12: TCP (Transmission Control Protocol) ensures reliable, ordered, and error-checked delivery of data, while UDP (User Datagram Protocol) is faster but does not guarantee delivery or order.

Security & Troubleshooting

Q13: What is a **firewall**?
A13: A firewall is a security device or software that monitors and controls incoming and outgoing network traffic based on predefined security rules.

Q14: What is **NAT (Network Address Translation)?**
A14: NAT allows multiple devices on a local network to share a single public IP address, improving security and conserving IP address space.

Q15: What is a **VPN (Virtual Private Network)?**
A15: A VPN creates a secure, encrypted connection over the internet, allowing users to access a private network remotely and securely.