1. What are the different types of networks?
- **Personal Area Network (PAN):** A small network, typically within a range of a few meters, that is used for connecting personal devices like smartphones, tablets, and laptops.
- **Local Area Network (LAN):** A network that connects computers within a small geographical area, such as a home, school, or office building.
- **Metropolitan Area Network (MAN):** A network that covers a larger geographic area than a LAN, often spanning a city or a large campus.
- **Wide Area Network (WAN):** A network that spans a large geographical area, such as a country or continent, and typically consists of multiple LANs connected together.
- **Wireless Local Area Network (WLAN):** A LAN that uses wireless technology (e.g., Wi-Fi) to connect devices within a local area.
- **Virtual Private Network (VPN):** A secure network that uses public telecommunication, such as the Internet, to provide remote offices or individual users with secure access to their organization's network.

2. Explain the Shielded Twisted Pair (STP) and Unshielded Twisted Pair (UTP)
- **Unshielded Twisted Pair (UTP):** UTP cables consist of pairs of wires twisted together to reduce electromagnetic interference. They are commonly used in Ethernet networks and are more flexible and less expensive compared to STP.
- **Shielded Twisted Pair (STP):** STP cables have additional shielding around the twisted pairs, which provides better protection against electromagnetic interference (EMI) and crosstalk. STP is used in environments with high interference but is more expensive and less flexible than UTP.

3. What is the difference between baseband and broadband transmission?
- **Baseband Transmission:** A method of transmitting a single signal over a communication channel without modulating it with a carrier signal. In baseband, the entire bandwidth of the channel is used by the single signal.
- **Broadband Transmission:** A method of transmitting multiple signals simultaneously over a single communication channel, typically by dividing the channel into multiple frequency bands, with each band carrying a different signal.

4. What is the difference between a hub, modem, router, and a switch?
- **Hub:** A basic networking device that connects multiple devices in a LAN and broadcasts data to all connected devices.
- **Modem:** A device that modulates and demodulates analog signals to digital data, allowing internet access over phone lines, cable, or fiber connections.
- **Router:** A device that routes data between different networks, often used to connect a home network to the internet. It can direct traffic and determine the best path for data.
- **Switch:** A networking device that connects devices within a LAN and intelligently sends data to the specific device (based on MAC address) rather than broadcasting it like a hub.

5. When you move the NIC cards from one PC to another PC, does the MAC address get transferred as well?
Yes, the MAC address, which is a unique identifier assigned to the Network Interface Card (NIC) by the manufacturer, is tied to the hardware itself. Therefore, when you move the NIC to another PC, the MAC address moves with it.

6. When troubleshooting computer network problems, what common hardware-related problems can occur?
- **Faulty cables or connectors:** Damaged or improperly connected cables can cause intermittent or no connectivity.
- **Failed network interface cards (NICs):** A defective NIC can prevent a computer from connecting to the network.
- **Malfunctioning switches, routers, or hubs:** Hardware failures in these devices can disrupt network communication.
- **Power supply issues:** A failing power supply can cause network devices to lose connectivity or function intermittently.
- **Configuration errors:** Incorrect hardware configuration, such as improper router or switch settings, can lead to connectivity issues.

7. In a network that contains two servers and twenty workstations, where is the best place to install an Anti-virus program?
Anti-virus software should be installed on all workstations and servers within the network. This ensures that all devices are protected from malware, viruses, and other security threats.

8. Define Static IP and Dynamic IP? Discuss the difference between IPv4 and IPv6.
- **Static IP:** An IP address that is manually assigned to a device and does not change over time.
- **Dynamic IP:** An IP address that is automatically assigned to a device by a DHCP server and can change each time the device connects to the network.
- **IPv4:** The fourth version of the Internet Protocol, using 32-bit addresses, allowing for about 4.3 billion unique addresses.
- **IPv6:** The sixth version of the Internet Protocol, using 128-bit addresses, allowing for a vastly larger number of unique addresses (approximately 3.4 x 10^38).

9. Discuss the TCP/IP model in detail.
The TCP/IP model is a conceptual framework used to understand the internet's structure and communication protocols. It has four layers:
- **Application Layer:** Handles high-level protocols and data representation (e.g., HTTP, FTP, SMTP).
- **Transport Layer:** Manages end-to-end communication, error checking, and data flow control (e.g., TCP, UDP).
- **Internet Layer:** Handles logical addressing, routing, and packet forwarding (e.g., IP).

- **Network Interface Layer (Link Layer):** Deals with the physical transmission of data over the network (e.g., Ethernet, Wi-Fi).

10. What is a Web Browser (Browser)? Give some examples of browsers.
A web browser is a software application that allows users to access, retrieve, and view content on the World Wide Web. Examples include:
- **Google Chrome**
- **Mozilla Firefox**
- **Microsoft Edge**
- **Safari**
- **Opera**

11. What is a search engine? Give an example.
A search engine is a software system designed to search for information on the World Wide Web. It indexes websites and displays relevant results based on a user's query. Example:
- **Google**
- **Bing**
- **Yahoo!**

12. What is the Internet & WWW? What are the uses of the internet in our daily life?
- **Internet:** A global network of interconnected computers that communicate using standardized protocols.
- **WWW (World Wide Web):** A system of interlinked hypertext documents accessed via the Internet.
- **Uses in daily life:** Communication (email, social media), information access (news, search engines), online shopping, banking, education, entertainment (streaming, gaming), and remote work.

13. What is an Internet Service Provider (ISP)? Give some examples of ISP in India.
An ISP is a company that provides individuals and businesses access to the internet. Examples in India:
- **Airtel**
- **Reliance Jio**
- **BSNL**
- **Vodafone Idea**
- **ACT Fibernet**

14. Discuss the difference between MAC address, IP address, and Port address.
- **MAC Address:** A unique hardware identifier for a device's network interface, used at the data link layer.
- **IP Address:** A logical identifier for a device on a network, used at the network layer.

- **Port Address:** A logical identifier within the transport layer, used to distinguish different services or applications on the same IP address.

15. How do we view my Internet browser's history?
To view your internet browser's history:
- **Google Chrome:** Click on the three-dot menu in the top right corner, select "History."
- **Mozilla Firefox:** Click on the three-line menu in the top right corner, select "History."
- **Microsoft Edge:** Click on the three-dot menu in the top right corner, select "History."
- **Safari:** Click on "History" in the top menu bar and select "Show All History."