1. What are the different type of network?

Different type of networks are:

a) Local Area Network (LAN):

- A local area network (LAN) is usally privately owned and links the devices in a single office, building, or campus.
- Depending on the needs of an organization and the type of technology used, a LAN can be as simple as two PCs and printer in someone's home office; or it can exxtend throughout a company and include audio and video peripherals.
- LAN are designed to alloe resources to be shared between personal computers or workstations.
- The resources to be shared can include hardware(e.g., a Printer),softeware(e.g., an application program), or data.
- One of the computer may be given alarge capacitydisk drive and may become a server to clients.
- Software can be stroed on this central server and used as needed by the whole group.
- In addition to size, LANs are distnguished from other types of networks by their transmission media and topology.

b) Wide Area Network(WAN):

- A wide area network (WAN) provides long-distance transmission of data, image, audio, and video information overlarge geographic areas that may comprise a country, a continent, or even the whole world.
- A WAN can be as complex as the backbones that connect the internet or as simples as a dial-up line that connect a home computer to the internet.
- We normally refer to the first as a switched WAN and to the second as point-to-point WAN.
    - The switched WAN connect the end systems, which usally comprise a router .
    - The point-to-point WAN is normally a line leased from a telephone or cable TV provider that connect a home computer or a small LAN to an internet services provider(ISP). This type of WAN is often usedto provide internet access.

2. Explain the shielded twisted pair(STP) and unshielded twisted pair(UTP)

- Shielded twisted pair (STP):
    - STP is protected with a foil or mash shield.
    - STP is signficantly more expensive than UTP.
    - It necessitates the use of a grounding cable.
    - STP was very little crosstalk.
- Unshielded twisted pair:
    - UTP cable is a twisted pair cable made up of twisted wires.
    - The price of UTP is lower than that of STP.
    - It does not necessiate the use of a grounding cable.
    - UTP contains a lot of crosstalk.

3. What is difference between baseband and broadband traansmission?

Baseband :

- Communication is bidirectional.
- Use digital signals.
- Signals can be sent for short distances.
- Work with bus topology.
- In order to improve the strength of signals, repeaters are utilized.
- Capacity of frequency is less than 100kHz.
- Signals are received on same channel.
- Signals are sent over copper wires or fiber optic cables.
- Best suited for wired networks.
- Supports time division multipiexing.
- The impedance of baseband transmission is 50 ohms.
- Installation and maintenance are both simple.
- Use in ethernet.

Broadband :

- Communication is undirectional.
- Uses analog signals.
- Signals can be sent for long distances.
- Works with tree and bus topology.
- In order to improve the strength of signals, amplifiers are utilized.
- Bandwidth capoacity is higher than 100 kHz.
- Two distinct channels are required to deliver and receive signals.
- Signals are sent over the air through an RF network.
- Best suited for wireless networks.
- Supports frequency division multiplexing.
- A 70-ohm impedance is used for broadband transmission.
- Installation and maintanance are challenging.
- Use in telephone networks.

4. What is difference between a hub, modem, router and a switch?

- **Hub** :
  - They operate in the physical layer of the OSI model.
  - It is nono-intelligent network divice that sends massage to all ports.
  - It primarily broadcast massages.
  - Tranmission mode is half duplex.
  - Collisions may occurs during setup of transsmision when more than one computers place data simultaneously in the correspondig ports.
  - They are passive devices, they don't have any software associated with it.
  - They generally have fewer ports of 4/12.
- **Modem** :
  - A modem is a hardware which connects to a computer, broadband network or wireless router.
  - Modem converts information between analogue and digital formats in real time making seamless two –way network communication.
  - The full from of modem or modem stands for modulator-demodulator.

- Modulations is performed to extend the frequency of the signal for propagation at pruduction purpose, where as demodulation is performed at receving purpose to bring down the signal to its original level.

- **Router** :
  - Roters packets to their networks until they reach their destination.
  - Needs to be setup with its routing table.
  - Has its own IP address.
  - Deal with IP address in IP packets.
  - Consist of built in routing software that asists in dealing with the IP packets.
  - Allows forming large metwork by connecting multiple routers directly.
- **Switch** :
  - Passes the frames in a network.
  - Is usally ready to use.
  - Does not have its own IP address.
  - Deal with MAC address.
  - Does not hve any built in software.
  - Prevents forming a large network by connecting multiple switches directy.

5. When you move the NIC cards from one PC to another PC, does the MAC address gets tranferred as well?

- Yes, the MAC address gets transferred as well.

6. When troubleshooting computer network problems, what common hardware related problems can occur?

- Common hardware problems are PaBX, LAN Card, WALN Card and wi-fi AP if it os wireless, Cables, Switches, Routers and wireless controllers.
- Most problems are hardware related, a flunt power cable or power supply unit.
- Sometime RAM needs to be upgraded or VGA cable is not properly connected.

7. In a network that contains two servers and twenty workstations, where is the best place to install an Anti-virus program?
   - An anti-virus program must be instelled on all severs and workstations to ensure protection,
   - That's because indivisual users can access any workstation and introduce acomputer virus when plugging in their removable hard drives or flash drives.

8. Define Static IP and Dynamic IP? Discuss the difference between IPV4 and IPV6 .
   - Static IP
     - A computer on the internet can have a static IP address, which means it stays the same over time.
   - Dynamic Ip
     - Dynamic IP address is a temporary address for device connected to a network that continually changes over time.

❖ Difference between IPV4 AND IPV6

IPV4:

- IPV4 doesn't provide encryption and authentication.
- In the IPV4, the header ranges from 20-60 bytes,which is more than the IPV6 and is complex.

- One of the things avialable on IPV4 is the checksum field.
- The IPV4 doesn't contain the packet flow identification.
- The representation in the IPV4 happens through the dot-decimal method. The decimal point is 4,and the numbers range from zero to two hundred and fifty-five.

IPV6:

- IPV6 provides encruption and authentication.
- In the IPV6, the header range is fixed at 40 bytes, which is a simplified routing process.
- One of the things does not available on IPV6 is the checksum field.
- The IPV6 contains packet flow identification, and the flow lable field is available in the header.
- The IPV6 address are represented as eight groups of four hexadecimal digits, each group representing 16 bits.

9. Discuss TCP/IP model in detail.

- **TCP/IP:**
  - It stands for Transmission control protocol/Interner protocol.
  - TCP/IP is a concise version of the OSI model.
  - It contains four layers, unlike the seven layers in the OSI model.
  - The number of layers is sometimes reffered to as five or four,
  - The Physical layer and Data link layer are reffered to as one simgle layer as the 'physical layer' or 'Network interface layer' in the reference.
  - The main work of TCP/IP is to transfer the data of a computer from one device to another.
  - The main condition of this process is to make data reliable and accurate so taht the receiver will receive the same information which is sent by the sender.

10. What is web browser(Browser)? Give some example of browser.

- **Web Browser:**
  - A web browser is an application for accessing websites.
  - When a user requests a web page from a particular website, the browser retrieves its files from a web server and then displays the page on the user's screen.
  - Browsers are used on a range of devices, includeing desktops, laptops,tablets and smartphones.

    Example of browser:
    - Internet Explorer.
    - Google Chrome.
    - Mozila Firefox.
    - Safari.
    - Opera.
    - Konqueror.
    - Lynx.

11. What is a search engine? Give example.

- **Search engine:**
  - A search engine is a software program that helps people find the information they are looking for online using keywords or phrases.
  - Search engine are able to return results quickly even with millions of website online by scanning the internet continuosly and indexing every pages they find.

    Examples:
    - Google search
    - Youtube

- Amazon
- Facebook
- Microsoft Bing
- Baidu
- Yandex

12. What is the internet & WWW? What are the uses of internet in our daily life.

Internet :

- The internet is a global network of networks connecting millions of users world wide via many computer networks using a simple strandard common adddressing system and basic communications protocol called TCP/IP.
- This allow the messages sent over the internet to be broken into small pieces, called packets, which tarvel over many different routes between source and destination computers.

WWW(World Wide Web) :

- WWW is leading informtion retrieval service of the web(The World Wide computer network).
- Online gives users access to huge array of documents that are connected to every other by means of hypertext or hyper media links- i.e, hyperlimks, electronic connections that link related pieces of data so to permit a user quick accesss to them.

The uses of internet in our daily life are :

- Social networking
- Online shopping
- Online banking
- Education and Upskilling
- Gaming
- Trading
- Email communication

13. What is an internet service provider? Give some example of ISP in India.

Internet sevice provider:

- An internet service provider(ISP) is a companythat provides accessto the internet.
- ISP can provide this access through multiple means, including dial-up, DSL, cable, wireless and fiber optic connection.
- A variety of companies serve as ISPs, including cable providers, mobile carriers,and telphone companies.

Example of ISP in India : Hathway, BSNL, Tata teleservices, Verizon, Reliance Jio, ACT Fibernet and many more working in India.

14. Discuss the difference between MAC address, IP address and port address.

MAC address:

- MAC address is a 6 byte hexadecimal address.
- ARP is used to get MAC address of device.
- NIC card's manufacturer provides the MAC address.
- MAC address is the physical address of computer.
- MAC address operates in the data link layer of OSI model.
- MAC address helps in simply identifying the device.
- MAC address of computer cannot be changed with time and environment to it is fixed.

IP address:

- IP address for Ipv4 is of 4 bytes size and for Ipv6 is 16 bytes.
- RARP used to get IP of device.
- Network administrator or internet service provider (ISP) provides IP address.
- IP address is the address of the layer-3 IP protocol.
- IP address used to identify a host.
- IP address works to send datagram traffic across network from source machine to destination machine.
- E.g. – 192.168.0.1, 172.16.0.1 are some of IP address.

Port address:

- The port address is 16 bits and assigned by the Network operating systyem when the application process creats the sockets.
- Port no. for application is decided by the Kernel of the OS. This port no. is called port address.
- Port address used to identify an application/service on your system.
- Port address is a layer -4 address used by some layer -4 protocols e.g. TCP and UDP.
- After IP delivers the packet to destination, with the help of the port numbers OS direct the data to the correct application.
- E.g. – Port number 80 for http traffic, 67 and 68 for DHCP traffic etc.

15. How do we view my internet browser's history?

- On your computer, open Chrome.
- At the top right, click more.
- Click history.