Q1. What is the different types of network ?

Ans. A network consist of two or more computers that are linked in order to share resources (such as printers and CD's), exchange files, or allow electronic communications. The computers are on a network may be linked through cables, telephone lines, radio waves, satellites, or infrared light beams. Two very common types of networks include:

- Local Area Network (LAN)
- Wide Area Network (WAN)

Local Area Network (LAN)- A Local Area Network is a network that is confined to a relatively small area. It is generally limited to a geographic area such as a writing lab, school or building. Computers connected to a network are broadly categorized as servers or workstations. Servers are generally not used by humans directly, but rather run continuously to provide "services" to the other computers on a network. Services provided can include printing and faxing, software hosting, file storage and sharing, messaging, data storage and retrivel, complete access control for the network's resources, and many in others. Workstations are called such because they typically do have a human user which interacts with the network through them. Servers tend to be more powerful than workstations, although configurations are guided be needs. On a single LAN, computers and servers may be connected by cables to the network, because the cable connections remain the fastest. Workstations which are stationary are also usually connected by a cable to the network, although the cost of wireless adapter has a dropped to the point that, when installing workstations in an easier and less expensive to use wireless for a desktop.

Wide Area Network (WAN)- Wide Area Network connect networks in larger geographic areas, such as Florida, the United States, or the world. Dedicated transoceanic cabling or satellite uplinks may be used to connect this type of global network. Using a WAN, schools in florida can communicate with places like places like Tokyo in a matter of seconds, without paying enormous phone bills. Two users a half-world apart with workstations equipped with microphones and a webcams might teleconference in real time. A WAN is complicated. It uses multiplexers, bridges and routers to connect local and metropolitan networks to global communications network like the internet. To users, however, a WAN will not appear to be much different than a LAN.

Q2. Explain the Shielded Twisted Pair (STP) and Unshielded Twisted Pair (UTP).

Ans. **Shielded twisted pair-** is a special kind of copper telephone and local area network (LAN) wiring used in some business installations. It adds an outer covering or shield that functions as a group to ordinary twisted pair wiring. Twisted pair is the ordinary copper wire that connects many computer networks to the telephone company. To reduce cross-talk or electromagnetic induction between pairs of wires, two insulated copper wires are twisted around each other. Each signal on twisted pair requires both wires.

Unshielded twisted pair- UTP cables are widely used in the computer and telecommunications industry as Ethernet cables and telephone wires. In an UTP cable, conductors which form a single circuit are twisted around each other in order to cancel out electromagnetic interference (EMI) from external sources. Unshielded means no additional shielding like meshes or aluminium foil, which add bulk, are used. UTP cables are often groups of twisted pairs grouped together with colour coded insulators, the number of which depends on the purpose.

Q3. What is the difference between baseband and broadband transmission?

Ans.

Baseband Transmission	Broadband Transmission
It is a data transmission technique in which one signal needs the whole bandwidth of the channel transfer the data.	It is a transmission technology in which many signals different frequencies send data across a single channel at the same time.
It utilize digital signals.	It utilize analog signals.
The signals may be transmitted in both direction.	The signal may transmit only one direction.
It is bidirectional in nature.	It is unidirectional in nature.
It uses time division multiplexing (TDM).	It uses frequency division multiplexing (FDM).
It operates with bus topology.	It operates with both bus and tree topology.
It utilize the same channel for sending and receiving data.	It utilize two channels, one for transmission and the second for data reception.

Signals are only capable of travelling limited distances. Attenuation is needed for long distances.	Signals may be transmitted across long distances without attenuation.
It is simple and easy to install and maintain.	It is complex to install and maintain.
It is less expensive to design.	It is costly to design.
It utilizes coaxial cables, wires and twisted pair cables as the transfer medium for digital signals.	It sends digital signals via coaxial cable, optical fibre cables and radion waves.
It contains 50ohm impedance.	It contains 70ohm impedance.
It is usually found in Ethernet.	It is usually found in telephone networks and cables.

Q4. What is the difference between hub, router and switch?
Ans.

Hub	Switch	Router
Hub is a physical layer device i.e. layer 1.	Switch is a data link layer device i.e. layer 2.	Router is a network layer device i.e. layer 3.
A hub works the basis of broadcasting.	Switch works on the basis of MAC address.	A router works on the basis of IP address.
A hub is a multiport repeater in which a signal introduced at the input of any port appears at the output of the all available ports.	A switch is a telecommunication device which receives a message from any device connected to it and then transmits the message only to the device for which the message is intended.	A router reads the header of incoming packets and forward it to the port for which it is intended there by determines the route. It can also perform filtering and encapsulation.
Hub is not an intelligent device that may include amplifier on repeater.	A switch is an intelligent device as it passes on the message to the selective device by inspecting the address.	A router is more sophisticated and intelligent device as it can read IP address and direct the packets to another network with specified IP address. Moreover routers can built address tablets that helps in routing decisions.
At least single network is required to connect.	A t least single network is required to connect.	Routers need at least two networks to connect.
Hub is cheaper as compared to switch and router.	Switch is an expensive device than hub.	Router is a relatively much more expensive device than hub and switch.
Speed of original hub 10Mbps and modern internet hub is 100Mbps.	Maximum speed is 10Mbps to 100Mbps.	Maximum speed for wireless is 1-10Mbps and maximum speed for wired connections is 100Mbps.
Hubs are used in LAN's.	Switch is used in LAN's.	Routers are used in LAN's, MAN's and WAN's.

5. When you move the NIC cards from one PC to another PC, does the MAC address gets transferred as well?
Ans. When you move the NIC cards from one PC to another PC, the MAC address gets transferred because MAC addresses are hard wired into the NIC circuitry, not the PC. This also means that a PC can have a different MAC address when the NIC card was replace by another one.

6. When troubleshooting computer network problems what common hardware related problems can occur?
Ans. Most common hardware are PaBX, LAN Card, WLAN Card and Wi-Fi if it is wireless, Cables, Switches, Routers and Wireless Controllers. Most problems are a faulty power cable or power supply unit. Sometimes 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 programme?

Ans. Anti-virus should be on each computer, if you implement server and node base anti-virus that will be best for controlling.

There are no special problems just because you are two servers and 20 computers. Every general issue will come along with critical. It will be same as any other computer setup issue.

8. Define static IP address and Dynamic IP address. Discuss the difference between IPV4 and IPV6.

Ans. **Static IP address** is an IP address that was manually configured for a device instead of one that was assigned by a DHCP server. It's called static because it doesn't change as a dynamic IP address.

Routers, phones, tablets, desktops, laptops and any other device that can use IP address can be configured to have a static IP address.

Dynamic IP address is an IP address that changes from time to time unlike a static IP address. Most home networks are likely to have a dynamic IP address and the reason for this is because it is cost effective for Internet Service Providers to allocate dynamic IP address to their customers.

Difference between IPV4 and IPV6-

IPV4	IPV6
IPV4 is a 32-bit address.	IPV6 is a 128-bit address.
IPV4 is a numeric address that consists of 4fields which are separated by dot (.).	IPV6 is an alpha numeric address that consists of 8 fields, which are separated by colon (;).
IPV4 has 5 different classes of IP address that includes Class A, Class B, Class C, Class D and Class E.	IPV6 does not contain classes of IP addresses.
IPV4 has a limited number of IP addresses.	IPV6 has a large number of IP addresses.
It supports VLSM, here VLSM means that IPV4 converts IP address into a subnet of different sizes.	It does not support VLSM.
It supports manual and DHCP configuration.	It supports manual, DHCP, auto configuration and renumbering.
It generates 4 billion unique addresses.	It generates 340 unbillion unique addresses.
In IPV4, end to end connection integrity is unachievable.	In the case of IPV6, end to end connection integrity is achievable.
In IPV4 security depends on the application.	In IPV6 IPSEC is developed for security purposes.
The checksum field is available in it.	The checksum field is not available in it.

9. Discuss TCP/IP model in detail.

Ans. TCP/IP stands for Transmission Control Protocol/ Internet Protocol and is a suite of communication protocols used to interconnect network devices on the internet, TCP/IP is also used as a communications protocol in a private computer network (an intranet or extranet).

TCP/IP specifies how data is exchanged over the internet by providing end to end communications that identify how it should be broken into packets, addressed, transmitted, routed and received and is designed to make networks reliable with the ability to recover automatically from the failure of any device on the network.

The two main protocols in the IP suite serve specific functions. TCP defines how applications can create channels of communication across a network. It also manages how a message is assembled over the internet and reassembled in the right order at the destination address.

How does TCP/IP work?

1. TCP/IP uses the client-server model of communication in which a user or machine (a client) is provided a service, like sending a webpage, by another computer (a server) in the network.

The transport layer itself, however is stateful. It transmits a single message and its connection remains in place until all the packets in a message have been received and reassembled at the destination.

The four layer of the TCP/IP Model-

2. TCP/IP functionally is divided into four layers, each of which includes specifies protocols:

The application layer provides applications with standardized data exchange. Its protocols include HTTP, FTP, Post Office Protocol 3, Simple Mail Transfer Protocol and Simple network Management Protocol. At the application layer, the payload is the actual application data.

The transport layer is responsible for maintaining end to end communications across the network. TCP handles multiplexing and reliability. The transport protocols include TCP and User Datagram Protocol, which is sometimes used instead of TCP for special purposes.

3. The network layer, also called the internet layer, deals with packets and connects independent networks to transport the packets across network boundaries. The network layer protocols are IP and Internet Control Message Protocols, which is used for error reporting.
4. The physical layer, also known as the network interface layer or data link layer, consists of protocols that operate only on a link the network. The protocols in this lowest layer include Ethernet for local area networks and Address Resolution Protocol.

10. What is a web browser? Give some examples of browsers.

Ans. A web browser is a software that is used to access the world wide web (www) or as known by everyone on the internet. It is an interface between us and the information available on the web.

Examples of some browser-

- Google chrome
- Safari
- Mozila Firefox
- Opera
- Microsoft edge
- Kingpin

11. What is a search engine? Give some examples.

Ans. A search engine is a web based tool that enables users to locate information on the WWW. Popular examples of search engines are Google, Yahoo and MSN search.

Some examples of search engines-

- Bing
- Baidu
- DuckDuckGo
- Yandex
- Ask.com
- Ecosia
- AOL
- Internet Archive

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

Ans. The **internet**- sometimes called simply “the net”, is a worldwide system of computer networks- a network of networks in which users at any one computer can, if they have permission, get information from any other computer (and sometimes talk directly to users at other computers). Today, the internet is a public, cooperative and self-sustaining facility accessible to hundreds of millions of people worldwide. It is used by many as the primary source of information consumption, and fuelled the creation and growth of its own social ecosystem through social media and content sharing.

WWW- The WWW, commonly known as the Web, is an information system enabling documents and other resources to be accessed over the internet through web servers and can be accessed by programs such as web browsers.

Uses of the internet-

- **In Education-**

Internet is used in an Education- The internet is a great platform for students to learn through their lifetime. They can use the internet to learn new things and even acquire degrees through online education programs.

- **To speed up daily tasks-**

The internet is very much useful in our daily routine tasks. For example, it helps us to see our notifications and emails. Apart from this, people can use the internet for money transfer, shopping, order online food.

- **Internet for shopping-**

With the help of the internet, anybody can order products online. With multiple choices ranging from online home décor stores to buying coats and jeckets from Gym king or similar companies, the options are endless.

Internet for researches and development-

The internet plays a pivotal role in research and development as it is propelled of the internet research. The benefit of the internet is enjoyed by small businessmen to big universities.

- **Communication-**

Without a doubt, the internet is the most powerful medium of communication at present. It connects people across different parts of the world free and fast.

Digital Transactions-

The internet facilities internet banking, mobile banking and stored in a database, it helps the government to track income tax details or income reports in the ITR.

- **Money Management-**

The internet can also be used to manage money. Now there are many websites, applications and other tools that help us in daily transactions, transfers, management, budget. With the growing popularity of digital currency, it could be said that the internet is the necessity of this century.

- **Tour and Travels-**

During tour and travels, the use of the internet is highly effective as it servers as a guide. People browse the internet before they start visiting the places. Tour bookings can also be done using the internet.

13. What is an Internet Service Provider (ISP)? Give some examples of ISP in India.

Ans. An Internet Service Provider is an organization that provides services for accessing, using or participating in the Internet. ISPs can be organized in various forms, such as commercial, community-owned. Internet services typically provided by ISPs can include Internet access, Internet transit, domain name registration, web hosting, Usenet service and colocation.

Some examples of ISP-

- Jio
- Airtel
- VI
- BSNL

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

Ans.

MAC Address	IP Address	Port Address
Mac address is a unique identifier that is assigned to a network interface controller/ card.	An IP address is an address that helps you to identify a network connection.	We use Port numbers for identifying any process/ service present on your system.
The full form of MAC address is media access control.	The full form of IP address is an internet protocol address.	A typical port number is 16 bits in size.
It is assigned by the manufacturer of the interface hardware.	It is assigned by the network administrator or internet service provider.	This address refers to that of the protocol of layer 4.
Information is send by Ethernet	Information is send by the network	The kernel of the OS provides an

using the mac address.	administrator or internet service provider.	application with its port number.
The mac filtering feature helps to prevent security threats by hackers.	The IP address does not have any specific filter.	One can use the netstat command for finding the available TCP ports along with the network statistics.
MAC defines the device identify.	IP address define how the device are connected to the network.	These numbers act as the logical interface utilized by the communication protocols.
MAC address is separated by colons.	IP address is separated by dots.	A few examples of port numbers are 67 and 68 for DHCP traffic.

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

Ans. To check history of internet browser follow these steps-

- On your computer, open chrome.
- In the address bar, enter @history.
- Press tab or space. You can also click search history. In the suggestions.
- Enter keywords for the page you previously visited.
- Select the page from the list.