Q1. What is Computer Network?

Ans. A computer network is a group of computers and peripheral devices, connected through a data communication system. A computer network facilitates the sharing of hardware and software resources among different users working on different computers.

These shared resources can be data files, any application software, or hardware devices like printers, modems, etc.

Q2. What is Network Router?

Ans. A router is a network device by which one or more separate networks are interconnected. If two or more network devices have to be connected, even if they are different types of networks, then you can communicate only through the router.

Q3. Which layer of the OSI model does the router work on?

Ans. A router operates at the network layer or layer 3 of the OSI model.

Q4. What is the Primary Function of a Network Router?

Ans. The main primary function of a network router are the followings-
- Restrict broadcasts to the LAN
- Act as a default gateway.
- Move data between networks.
- Learn and advertise loop free path.

Q5. Which companies are making network routers?

Ans. CISCO, Juniper, Nortel, 3Com, and HP are some top companies that manufacture network routers.

Q6. How Network Router Restrict Broadcast to the LAN?

Ans. A network Router divides a separate large set of hosts into different broadcast domains using a router to restrict broadcast to the LAN.

Q7. How does Router Move Data between Networks?

Ans. The router searches for the best route to send data from one network to another, then transfers the data this network may be the same organization or a different remote location.

A router can accept traffic from any kind of network it is attached to and forward it, to any other network. Routers allow a network that could not normally communicate with each other to exchange data.

Q8. Explain OSI Reference Model layers types and their functions.

Ans. There are seven layers in OSI Module. The functions of OSI layers are the followings-

OSI Reference Model layers	Functions
Application Layer	Provides a user Interface
Presentation Layer	Presents data, Handled Processing such as encryption.
Session Layer	Keeps Different Application's data separate.
Transport Layer	Provides reliable or unreliable delivery. Performs error correction before retransmitting.
Network Layer	Provides logical addressing, which router is used for path determination.
Data Link Layer	Combines packets into bytes and bytes Into frames. Provides access to media using Mac address. Performs error detection, not correction.
Physical Layer	Moves bits between devices. Specifies voltage, vire speed, and pinouts of cables.

9. Explain the Roles of the Application Layers.
Ans. The roles of the Application Layers are the followings-
- Network management activities
- Client/server processes
- Information location
- File transfers
- Email
- Enabling remote access

10. What is Telnet?

Ans. Telnet was one of the first Internet standards, developed in 1969, and is a chameleon of Protocol- Its feature is terminal emulation. This allows the user on a remote client machine, which is called Telnet client, to access resources of another machine.

Telnet server Access the command-line interface. telnet achieves this by swiftly pulling it to the telnet server and making the client machine appear as if it were a terminal directly connected to the local network.

This projection is actually a software image – a virtual terminal that can interact with the Selected remote host. One drawback is that there is no encryption technology available in Telnet protocol, so everything, including passwords, must be sent in cleartext.

11. What is Secure Shell (SSH)?
Ans. The Secure Shell (SSH) protocol establishes a secure session that is similar to Telnet over a standard TCP/IP connections and is employed to perform tasks such as logging into the system, running programs on remote systems, and moving files from one system to another, And it does all this time Maintaining an encrypted connection.
12. What is File Transfer Protocol (FTP)?

Ans. FTP (File Transfer Protocol) actually lets us transfer files, and it can accomplish this between any Two machines using it. But FTP is not just a protocol;

This is also a program. operating as a protocol, FTP is used by applications. FTP also allows access to both directories and files and can perform certain types of tasks directory.

13. What is Trivial File Transfer Protocol (TFTP)?

Ans. TFTP (Trivial File Transfer Protocol) is a stripped-down, stock version of FTP, but it Protocol of choice if you know exactly what you want and where to find it because it is faster and therefore easy to use.

This compact little protocol skimps on the data department too, sending very small blocks of data than FTP. Plus, there's no authentication with FTP, so it's even more insecure, and some Sites support it because of the inherent security risks.

14. When Should You Use FTP?

Ans. Let's say everyone in your Woodland office needs a 500 GB file emailed directly to them. far. What do you do? Many email servers reject that email due to size limit (too many) ISPs don't allow emailing files larger than 15MB or 20MB), and even if there is no size limit on the server, it will still take some time to send this huge file.

FTP to the rescue! If you need to give a large file to someone or you need to take a large file from someone, then FTP is a good choice. To use FTP, you must set up an FTP server on the Internet so that Files can be shared.

In addition to solving size issues, FTP is faster than email. Also because it uses TCP and Is connection-oriented, if the session dies, FTP can sometimes resume where it left off. try That with your email client!

15. What is Domain Name Service (DNS)?

Ans. Domain Name System (DNS) is one of the important Servers on the network and Internet as well because Domain Server is used to convert Internet Protocol (IP) address to Name resolutions or name resolutions to IP address.

For Example -IP address **216.58.221.36** is the address of **www.google.com**, We without have to type the IP address instead of simply typing www.google.com, from the example you can say that DNS is a Phone book of the Internet.

Domain Name System (DNS) used UDP (User Datagram Protocol) port number **53** to communicate with each other. DNS can be used in your Local Network or Internet without DNS you can not think about the Internet.

DNS server is the replacement of the Hosts.txt file for using the host's file you need to download the hosts' file and manually update it on systems. Hosts File is too difficult to manage after some limits.

16. What is Dynamic Host Configuration Protocol (DHCP)?

Ans. A dynamic Host Control Protocol server is used to assign automatic IP addresses to network hosts so they can communicate with each other.DHCP is a network protocol that works on a client-server architecture.

The DHCP server is too useful for the large organization because it's not possible n to provide manually IP addresses for the large organizations. DHCP server makes administration easy because you do not need to manged the IP addresses to all computers, the DHCP server will handle it itself. The DHCP server can be configured on the DSLR router also for small organizations.

DHCP server used UDP port numbers **67** and **68**. Port number 67 is used for providing services and port number 68 is used by the client to listen.DHCP works on the **DORA** process where-

- **Discover**
- **Offer**
- **Request**

- **Acknowledgment**

DHCP used the DORA process to allocate an IP address to Clients. if any new client wants to add to the network and wants to communicate with another device on the network. If you want to access a new client from the DHCP server then a new client sends the notification on a network called Discover message. Discover the message broadcast on all devices then the DHCP server broadcasts the **offer** message to the client.

New Client sends the IP address notification to the server for the IP address called Request lastly Server sends the message to all the devices called **Acknowledgment**.

17. What is Transmission Control Protocol (TCP)?

Ans. Transmission Control Protocol (TCP) takes large blocks of information from an application and Breaks them down into sections. It numbers and sequences each segment so that the TCP of the destination.

The stack can put the segments back in the order the application is intended for. after these sections are sent to the transmitting host, TCP waits for TCP acknowledgment from the receiving end Virtual circuit session, retransmitting any segment that has not been accepted.

18. What is User Datagram Protocol (UDP)?

Ans. UDP (User Datagram Protocol) is basically a scaled-down economy model of TCP, which is
Why is UDP sometimes referred to as a thin protocol? As a thin person on a park bench, a thin
The protocol does not take up much space in this case and requires a lot of bandwidth on the network.

UDP doesn't offer all the bells and whistles of TCP, but it does a great job transporting information that does not require reliable delivery, using very few network resources.

19. What is a Port Number of Telnet, SMTP, FTP, SSH, TFTP, DHCP, and NTP?

Ans. Port Number of Telnet SMTP, FTP, SSH, TFTP, DHCP, and NTP-

Telnet: 23
SMTP: 25
FTP : 20,21
SSH: 22
TFTP : 69
DHCP: 67
NTP: 123

20. What is Internet Protocol (IP)?

Ans. IP (Internet Protocol) is a unique address of any Computers and network Devices via which they communicate with each other. Internet Protocol is divided into parts **Network** and **Host**.

In Other Words, the Internet Protocol address is a unique identifier of any machine in the network used to communicate with each other. An IP address allows users to transfer files and email each other.

IANA (Internet Assigned Numbers Authority) defined or allocated an IP address globally. **ICANN**(Internet Corporation for Assigned Names and Numbers) is non Profit private Organisation that managed IANA.

IANA widely responds to provide Unique Names and numbers that are used in IP addresses. The main responsibility of IANA is to provide IP Addresses, Domain Names, and Protocol assignments and managed the timezone database.

21. What is Internet Control Message Protocol (ICMP)?

Ans. ICMP (Internet Control Message Protocol) operates at the network layer and is accessed by IP Many different services. ICMP is basically a management protocol and messaging Provider for IP.

Its messages are carried as IP datagrams. RFC 1256 is an annex to ICMP, which
Gives hosts an expanded ability to find routes to gateways.

22. What is Address Resolution Protocol (ARP)?

Ans. ARP (Address Resolution Protocol) finds a host's hardware address from a known IP Know. Here's how it works: When the IP has a datagram to send, it should notify network access protocol, such as Ethernet or wireless, on the local to the hardware address of the destination network.

Remember that this has already been informed by the upper-layer protocol of The IP address of the destination. If the IP does not find the hardware address of the destination host in ARP The cache uses ARP to find this information.

23. What is the difference between a Static IP Address and Dynamic IP address?
Ans.

S. N.	Static IP Address	Dynamic IP Address
1.	Do not need to Install any Server.	You need to install DHCP Server on the Network
2.	Useful for small Networks and Servers.	Useful for large Networks.
3.	Static IP Addresses can easily Trace.	A dynamic IP address can not be traced.
4.	Statics' IP address is not more secure.	A dynamic IP address is More secure.
5.	Do not change automatically.	The dynamic IP address will be changed after some lease times

24. Types of Classful IP address?

Ans. Classful IP address are defined into five categories from **A to E.**
Class A

Class A starting From 1-126 is used for large organizations or reserver for government organizations. In Class A IP address of containing 24 bits for Hosts and 8 Bits for networks.

Class A, You can use 128 possible networks and 16 million hosts. As per **Example – 10.1.1.29**.
Class B

Class B starts from 128-191 which is used for medium organizations or companies. In Class B 16 Bits are used for the Networks and 16 Bits are used for Hosts' address.

In Class B, You can possibly use 16000 thousand network addresses and 65000 thousand maximum host addresses.

Example- 128.134.1.10
Class C

Class C IP address starting from 192-223 that is used by small organizations or companies. Class C used 24 bits for the Networks and 8 bits used for host Addresses. Class C is popular and commonly used in organizations.

In Class C, You can create or used a maximum 2 million of network addresses and 256 possible hosts. **Example 192.168.1.1**

Class D
Class D IP addresses are used for multicasting and starting from 224-239. Multicasting is not deserved for particular Hosts, which do not need to extract the host's address from the IP address. **Example 239.255.255.255.**

Class E

Class E IP address starting from 240-255 that is used for experimental purposes and R&D. **Example**
240.0.0.1