1. **Role of networking in today's world? How it impact day to day life?**
   Ans: It is hard to imagine life without the internet. The use of network can enhance communication between employees in an organization and also with external clients.

   The Internet nowadays is used in various ways to make life easier:

    Receive and send email

   Obtain information and advice

   Online shopping and selling / auction

   Electronic banking

2. **Describe the feature operation and use of well-known TCP/IP internet layer services.**
   Ans: TCP/IP stands for Transmission Control Protocol/ Internet Protocol. The TCP/IP model is a part of the Internet Protocol Suite. This model acts as a communication protocol for computer networks and connects hosts on the Internet. Function of TCP/IP is Collecting and Reassembling Data Packets and then sending those data packets to correct destination. It is a concise version of the OSI Model and comprises five layers in its structure which are:
   1. Physical
   2. Network interface layer
   3. Internet
   4. Transport
   5. Application

3. **Explain VPN in network security. Differentiate B/w WiMAX and Wifi?**
   Ans: A VPN, or Virtual Private Network, allows us to create a secure connection to another network over the Internet. VPNs can be used to access region-restricted websites, shield our browsing activity from prying eyes on public Wi-Fi, and more.

Wifi stands for Wireless Fidelity.	WiMax stands for Wireless Inter-operability for Microwave Access.
WiFi uses Radio waves to create wireless high-speed internet and network connections.	WiMax uses spectrum to deliver connection to network and handle a larger inter-operable network.
Wifi is used in LAN applications.	WiMax is used in MAN applications.
Wifi does not gurrantee Quality of Service, QoS.	WiMax guarantees Quality of Service, QoS
Wifi network ranges at max 100 meters.	WiMax network ranges to max 90 kms.

4. **Define connection-less & connection-oriented protocols? Compare Tcp with UDP.**

   Ans: There is a sequence of operation to be followed by the users of connection oriented service. These are:

   Connection is established.
   Information is sent.
   Connection is released.
   In connection oriented service we have to establish a connection before starting the communication. When connection is established, we send the message or the information and then we release the connection.
   In connectionless the data is transferred in one direction from source to destination without checking that destination is still there or not or if it prepared to accept the message.
   Authentication is not needed in this

This protocol is connection-oriented.	This protocol is connectionless.
TCP is comparatively slower than UDP.	UDP is faster as compared to TCP.
TCP is less efficient as compared to UDP.	UDP is more efficient as compared to TCP.
TCP guarantees data delivery to the destination receiver/router.	UDP does not offer any guarantee regarding data delivery to the destination receiver/router.

5. **Describe guided & unguided media?**

   Ans:

The signal requires a physical path for transmission.	The signal is broadcasted through air or sometimes water.
It is called wired communication or bounded transmission media.	It is called wireless communication or unbounded transmission media.

It provides direction to signal for travelling.	It does not provide any direction.
E.g Twisted pair cable, coaxial cable and fibre optic cable.	E.g Radio wave, microwave and infrared.

6. **Differentiate b/w Logical Addressing(IP) & Physical Addressing(MAC).**
   Ans:

MAC Address stands for Media Access Control Address.	IP Address stands for Internet Protocol Address.
MAC Address is a six byte hexadecimal address.	IP Address is either a four-byte (IPv4) or an eight-byte (IPv6) address.
NIC Card's Manufacturer provides the MAC Address.	Internet Service Provider provides IP Address.
MAC Address operates in the data link layer.	IP Address operates in the network layer.
MAC Address helps in simply identifying the device.	IP Address identifies the connection of the device on the network.

7. **Differentiate b/w ARP & RARP**
   Ans:

ARP stands for Address Resolution Protocol.	Whereas RARP stands for Reverse Address Resolution Protocol.
Through ARP, (32-bit) IP address mapped into (48-bit) MAC address.	Whereas through RARP, (48-bit) MAC address of 48 bits mapped into (32-bit) IP address.

In ARP, broadcast MAC address is used.	While in RARP, broadcast IP address is used.
In ARP, ARP table is managed or maintained by local host.	While in RARP, RARP table is managed or maintained by RARP server.
Hosts and routers uses ARP for knowing the MAC address of other hosts and routers in the networks.	While RARP is used by small users having less facilities.

8. **Describe complete routing & switching procedure**

   Ans: Routing and Switching are different functions of network communications. The main differences between Routing and Switching are as below.

   ⇨ The function of Switching is to switch data packets between devices on the same network (LAN). The function of Routing is to Route packets between different networks.

   ⇨ Switches operate at Layer 2 of the OSI Model (Datalink Layer). A switch maintains a table of MAC addresses and what physical switch port they are connected to for sending data packets.

   ⇨ Routers operate at Layer 3 of the OSI Model (Network layer. A Router maintains a table called Routing Table and uses the routing table to determine the route to the destination network.

9. **Explain different packet & frame formats?**

   Ans:

   packets are composed of a header and payload.

   IP Header
   • HLen: Header Length
   • Version: IP Version
     • 4 for IPv4
   • 32-bit words (typically 5)
   • TOS: Type of Service
   • Priority information
   • Length: Packet Length
   • Bytes (including header)
   • Source Address
     • 32-bit IP address of sender
   • Destination Address
     • 32-bit IP address of destination

   frames consist of three major parts: header, body, and trailer

   ⇨ The frame header contains information about the where the frame is going, the data rate, cipher suite used to encrypt data frames

⇨ The body of a frame contains the layer 3-7 information that is encapsulated and, hopefully, protected (encrypted) as well. The body of a frame varies in size depending on the transmission.

⇨ The trailer contains the frame check sequence (FCS). This is a 32-bit cyclic redundancy check (CRC) used to validate that the contents of the entire frame have not become corrupted while being transferred over the wireless medium.