CCNA-Module-1

(1)Ans. The OSI (Open Systems Interconnection) model is a framework used to understand and design how data moves between devices in a network. It divides communication into seven layers.

the seven layers,

1. Application Layer

 users interact with the network (e.g., web browsers, email apps). It ensures the application can access the network.

2. Presentation Layer

It translates, encrypts, or compresses data so it can be understood by different systems.

3. Session Layer

Manages connections between devices. It opens, uses, and closes sessions (e.g., logging into a website).

4. Transport Layer

Ensures reliable data delivery, including error checking and data splitting (e.g., TCP and UDP protocols).

5. Network Layer

Handles routing and addressing data packets to ensure they reach the correct destination (e.g., IP addresses).

6. Data Link Layer

Manages data transfer between devices on the same network (e.g., MAC addresses, switches).

7. Physical Layer

Deals with the actual physical connection, like cables, signals, and network hardware.

(2)Ans.Two and multiple device are connected with each other.

(3)Ans.Two and more than two different types of network.

(4)Ans.Encapsulation is the process of packaging data with the necessary protocol information so it can travel across a network from one device to another.

Steps in Encapsulation (OSI Model Example):

1. Application Layer:

The user generates data, like a message or file.

Example: Writing an email.

2. Transport Layer:

The data is divided into smaller pieces called segments.

3. Network Layer:

The segment is placed inside a packet.

A network header is added, which includes source and destination IP addresses to route the packet.

Example: Determines where the email should go on the internet.

4. Data Link Layer:

The packet is encapsulated into a frame.

A data link header and footer are added, which contain MAC addresses (physical addresses) for local network delivery.

Example: Ensures the email reaches the correct device on the local network.

5. Physical Layer:
The frame is converted into bits (binary data) and transmitted as electrical, optical, or radio signals over the physical medium (e.g., cables, fiber, Wi-Fi).
Example: Physically sends the email data

(5)Ans.Peer-to-peer (P2P) communication is a type of network model where two or more devices (called peers) communicate directly with each other without relying on a central server or intermediary.

(6)Ans.TCP (Transmission Control Protocol) and UDP (User Datagram Protocol) are two protocols used to send data over the internet.
TCP
Reliable: Ensures data reaches the destination without errors and in the correct order.
Connection-based: Establishes a connection before sending data (like a phone call).
Slower: Due to error-checking and retransmissions.
Use Cases: Web browsing, file downloads, emails.
UDP
Unreliable: Sends data without ensuring it reaches the destination or is in order.
Connectionless: No setup before sending data (like a text message).
Faster: No error-checking or retransmissions.
Use Cases: Live video/audio streaming, online gaming, DNS.

(7)Ans.Internetwork Operating System (IOS) software is used in devices like routers and switches to manage networks. It controls routing, switching, security, and communication between networks. Example: Cisco IOS.

(8)Ans.LAN (Local Area Network) is a network that connects computers and devices within a small area, like a home, office, or school.
Key Features of LAN:
1. Small Area: Covers a limited physical area (e.g., a building).
2. High Speed: Typically faster than wider networks (e.g., WAN).
3. Private Network: Managed by an individual or organization.
4. Resource Sharing: Devices can share data, printers, or internet connections.

Example of a Simple LAN Diagram
1. A router connects to the internet.
2. A switch connects to the router for distributing network access.
3. Multiple computers, printers, or other devices connect to the switch.

(9)Ans. brief explanation of router, switch, and hub-
Router: Connects networks.
Switch: Directs data within a LAN.
Hub: Broadcasts data to all devices.

(10)Ans.A switch in a LAN connects multiple devices (like computers, printers) within the same network. using the device's MAC address. This makes communication more efficient than a hub, which sends data to all devices.
A switch directs data to the correct device within a LAN, improving speed and efficiency.

(11)Ans.Three types of cables and speed
a.ethernet
b.cross cable
c.roll over
Six types of ethernet cable
Cat5 - 10mbps
Cat5e - 100mbps
 Cat6 - 1gbps
Cat6a - upto 10gbps
 Cat7 - upto 10gbps
Cat7a - upto 40gbps
Cat8 - upto 40gbs

(12)Ans.Tcp(transmission control protocol) -It is used for data transferring and base protocol of all protocol.
Port no. - 17
Ip(internet protocol) - it is used for identify ip address.

(13)Ans.A node is any device or point in a network that sends, receives, or processes data.
Examples:
Devices: Computers, phones, printers, IoT devices.
Network Equipment: Routers, switches, hubs.
Servers: Systems providing resources or services.
Physics layer using cable and use rj45 connector all thing physical layer.