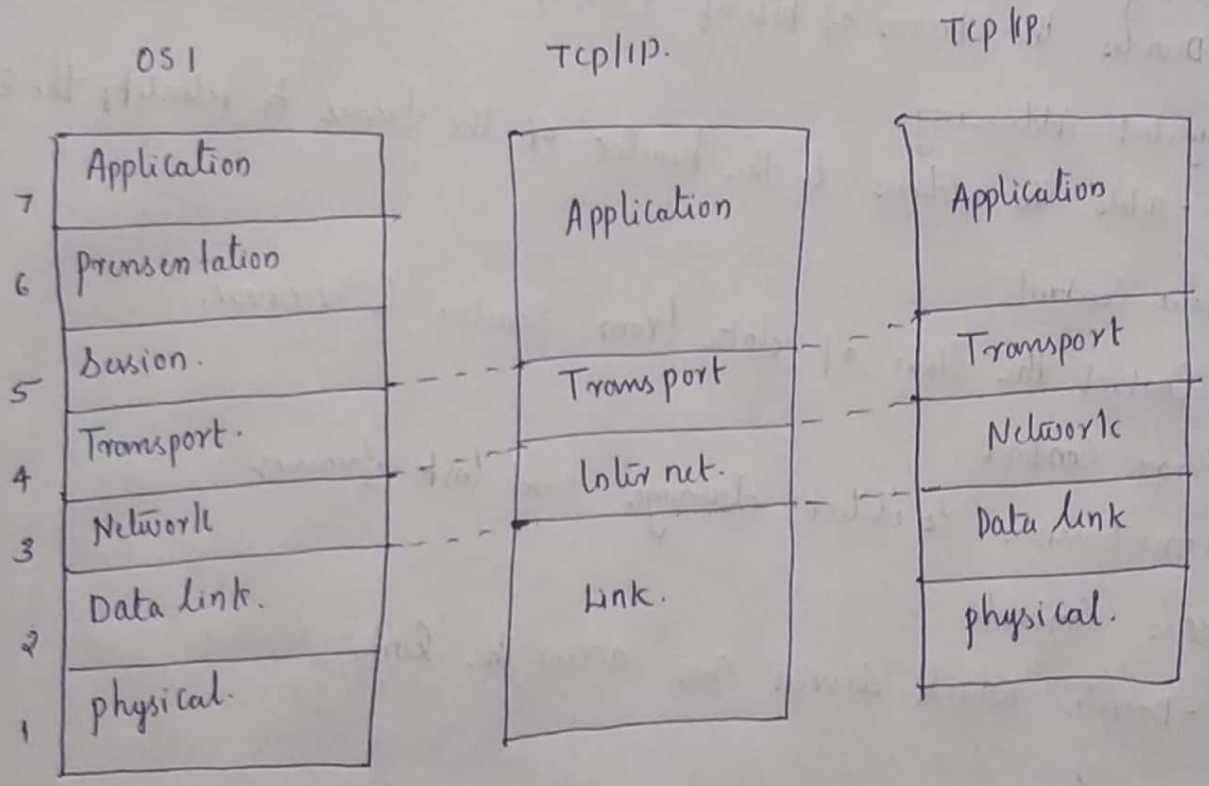
1. Compare Tcp/Ip protocol suite with osi model.

Tcp/IP protocol suite is made of four / five layers.

1. physical layer.
2. data link layer.
3. Network layer.
4. Transport layer.
5. Application layer.



physical layer.

it is responsible for the transmission and reception of bits.

- Data rate.
  - The number of bits per second that can be sent.

- Bit Synchronization.
  - The sender and receive must be synchronization at the symbol level so that the number of bits expected per unit time is the same.

- Configuration.
  - Defines point-to point or multipoint link.
- Topology.
  - Defines different types of topology like mesh, star, ring, bus.
- Mode.
  - Defines Simplex, half duplex and full duplex.

Data link Layer.

- framing.
  - Divides the stream of bits of frames.
- physical Addressing.
  - Adds the address to the header of the frame to identify the system.
- flow Control.
  - Control the flow of data from sender to receiver.
- Error Control.
  - mechanism to detect damage and lost frames.
- Access Control.
  - Decide which devices can access the link.

Network Layer.

- Responsible for source to destination delivery of packet.
- Logical Addressing.
  - Adds the universal address to the packet to identify the system.
- Routing
  - Routes the packet from source of destination

protocol used.

X Icmp - Internal Control Message protocol.

× IGmp - Internal Group management protocol
× ARP - Address Resolution protocol
× RARP - Reverse Address Resolution protocol.

Transport layer.

- Responsible for process to process Delivery.
- Adds port addresses.
  - To identify specify process
- Segementation and reassembly.
  - message is divided into transmittable segement with seq no
- Connection Control.
  - Connection oriented (TCP - Reliable)
  - Connectionless Services (UDP - unreliable)
- Flow Control
  - Control the flow of data from sender to receiver.
- Error Control.
  - mechanism to detect damage, lost, duplicate message.

× TCP - Transmission Control protocol
× UDP - user Datagram protocol
× SCTP - Stream Control Transmission protocol.

Application Layer.

- Session Establishment.
  - Establishment and maintains the interactions between two system.
- Data Conversation
  - Converts the data from sender dependent format to receiver dependent format.
- Compression.
  Reduce the no of bits contained in the information.

Encryption.

for privacy sender transforms the information into Coded. formats.

Remote Access.

Allows application to access the files in the remote host.

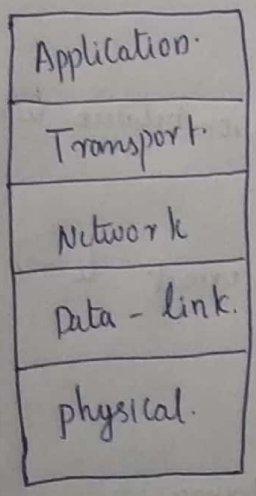
protocol used.

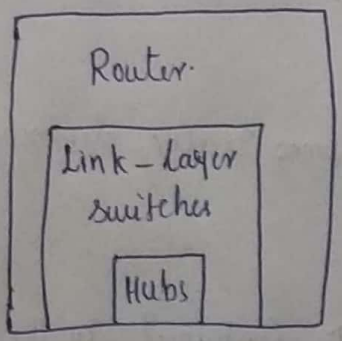
- SMTP - Simple mail transfer protocol
- FTP - file transfer protocol.
- HTTP - Hyper text Transmission protocol
- DNS - Domain Name Server.
- SNMP - Simple Network management protocol
- TELENT - Teletype Network.

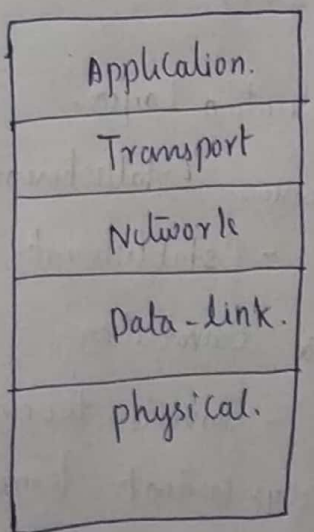
2) write a note on LAN Connecting devices.

Connecting devices is used to Connect hosts together to make a network or to Connect network together to make an internet There are three kinds of Connecting devices:

- Hubs.
- Link - layer switches
- routers.

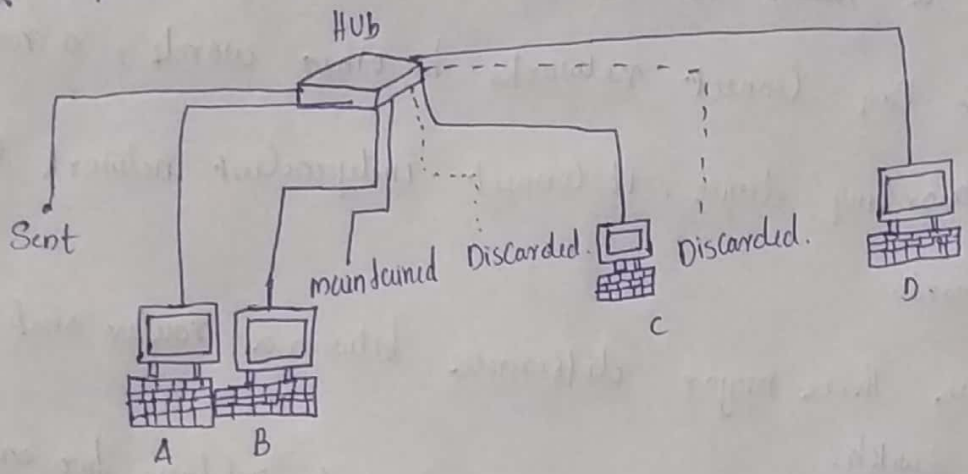






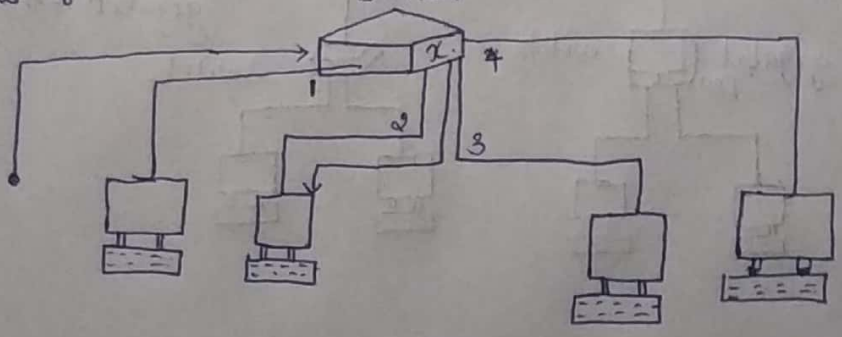
Hub

A hub is an device that operate only in the physical layer. Ethernet LANs use star topology or a star topology, a repeater is a multiport device, often called a hub that can be used to serve as the connecting point and at the same time function as a repeater.



Link-layer Switches

A link layer switch (or switch) operates in both physical and data link layers. As a physical layer device, it regenerates the signal it receives. As a link-layer device the link layer switch can check the MAC address contained in the frame. A link layer switch has filtering capability it can check the destination address of a frame and can decide from which outgoing port the frame should be sent.



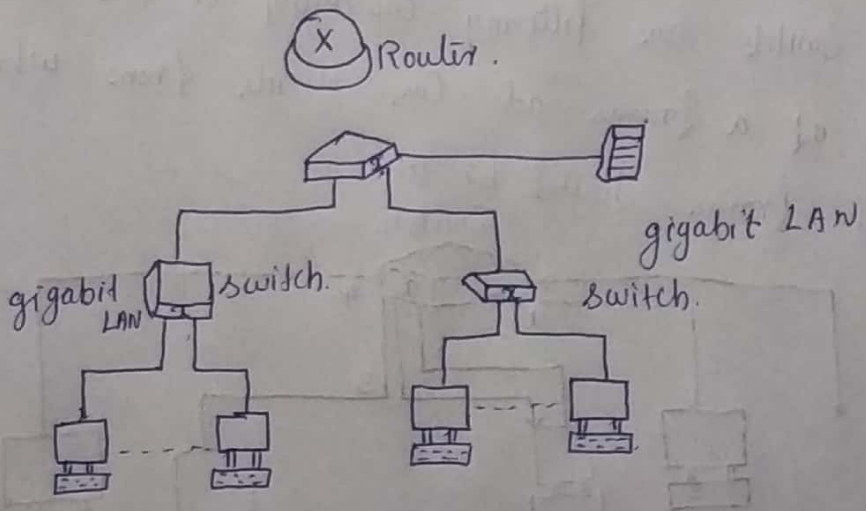
Router

A router is a three-layer device; it operates in the physical, data-link and network layers. As a physical-layer device it regenerate the signal it receives As a link layer device the, router checks the physical addressing Contained in the packet. As a network layer device, a router checks the network layer address.

A router can Connect networks be other words, a router is an internetworking device; it Connect independent network to form an internetwork.

These are three major differences between a router and a repeater or a switch.

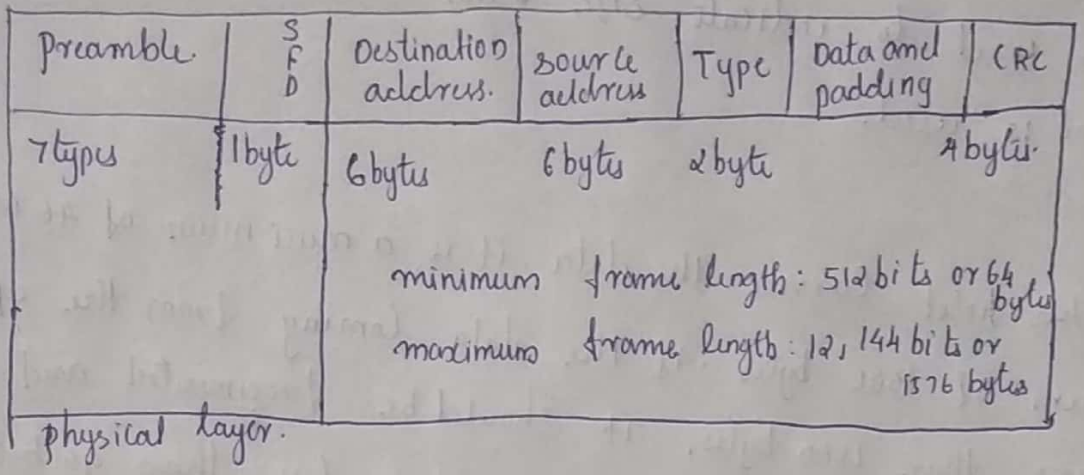
1. A router has a physical and logical address for each of its interfaces.
2. A router acts only on those packets in which the link to destination address.
3. A router changes the link-layer address of the packet when id forwards the packets.



3) Explain Ethernet frame formate with the help of a diagram.

Preamble : 56 bits of alternating 1s and 0s

SFD : Start frame delimiter, flag (10101011)



Preamble.

This field Contains 7 bytes (56 bits) of alternating 0s and 1s that alert the receiving system to the Coming here frame. The patter provides only an alert and a timing pulse.

Start frame delimiter (SFD)

The field signals the beginning of the frame The SFD warns the station or stations that this is the last chance for synchronisation The last 2 bits alert the reciever that next field is the destination address this field is actually a flag that defines the beginning of the frame

Destination Address (DA)

This field is six bytes (48 bits) and Contains address of the destination station or stations to receive the packet when the reciever sees its own address it decapsulates the data from the frame and passes the data to the Cupper layer protocol.

Source address (SA)

This field is also six bytes and contains the address the sender of the packet

Type.

it is used to indicate size of the ethernal frame or which protocol is used.

Data.

This field carries the data. it is a minimum of 46 and a maximum of 1500 bytes. if the data coming from the upper layer is more than 1500 bytes, it should be fragmented and encapsulated in more than one frame. if it is less than 46 bytes it needs to be padded with extra 0s.

CRC

The last field contains error detection information, in this case a CRC-32. if the receiver calculate the CRC and finds that it is not zero, it discard the frame

frame length.

Ethernut has imposed restrictions on both the minimum and maximum lengths of a frame. The minimum length ~~of a frame~~ ~~The exact~~ restrictions is required for the correct operation of CSMA/CD.