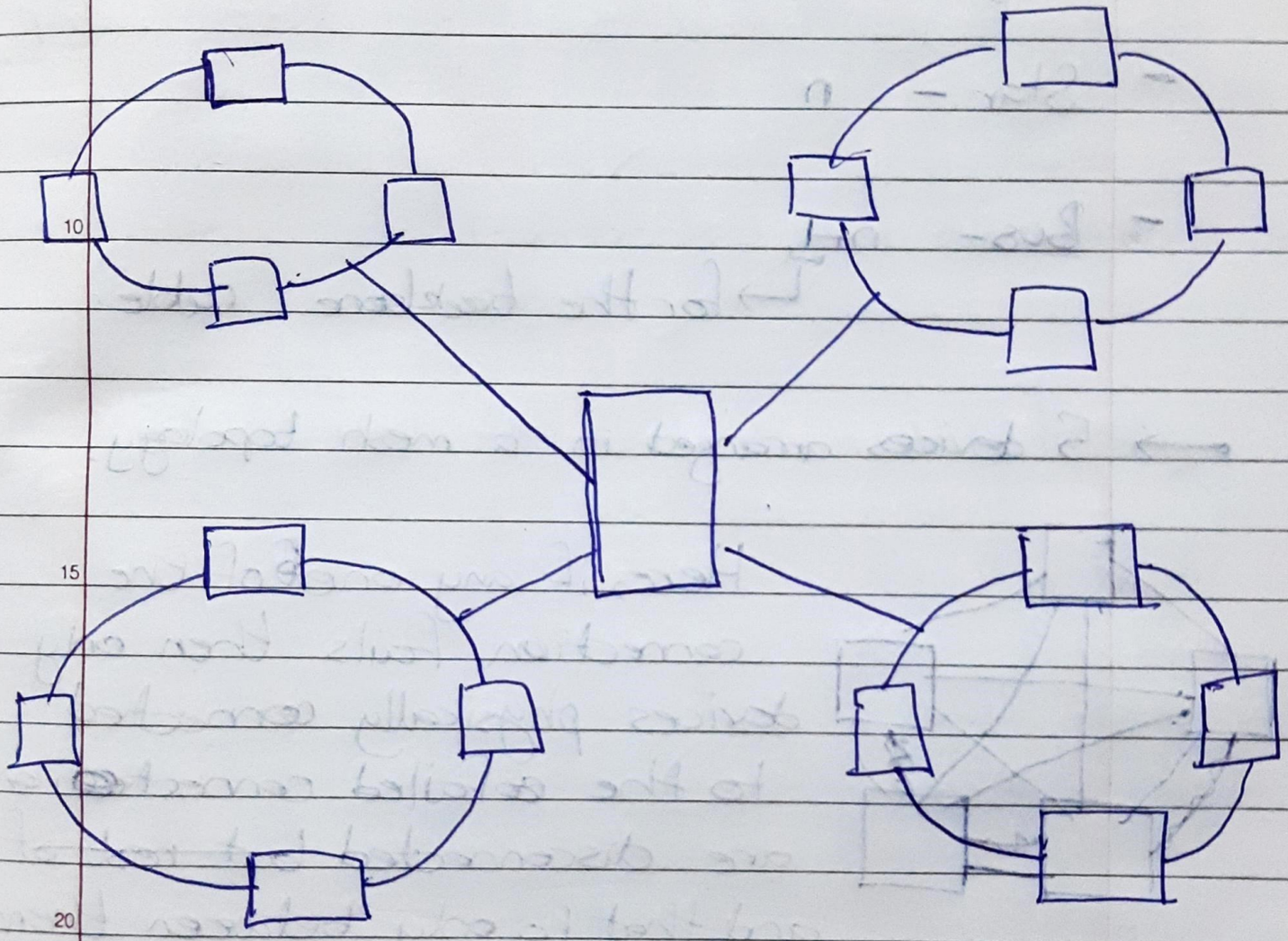
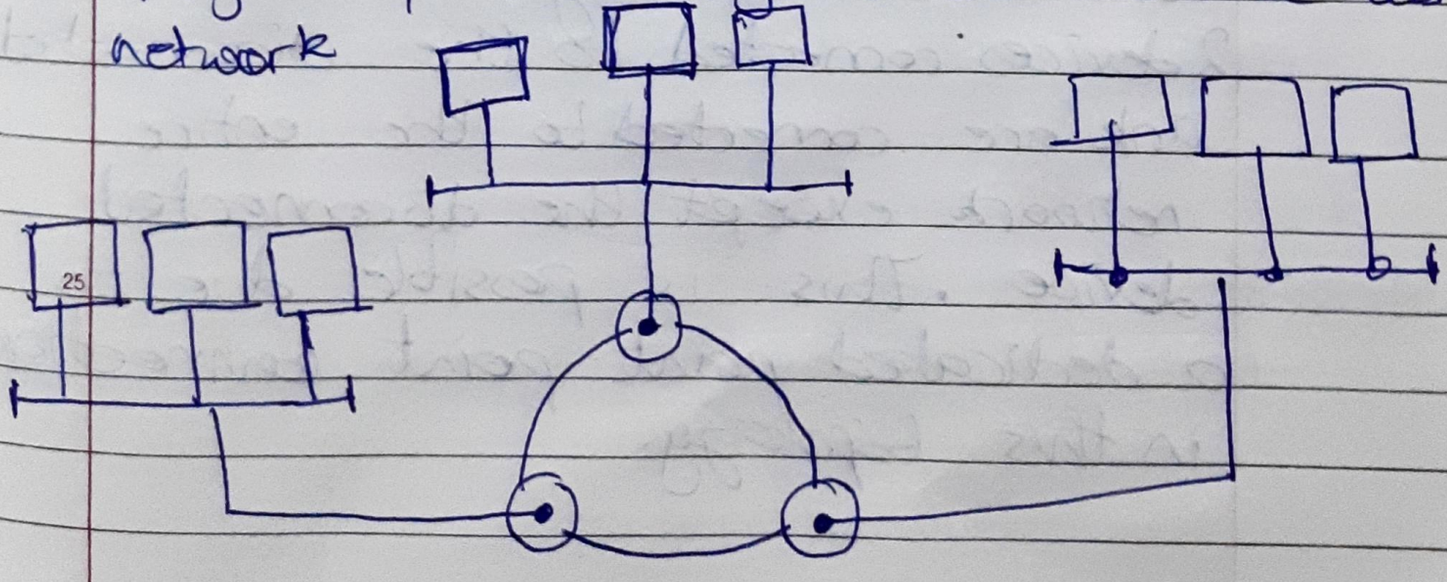
Tasks

→ Task-1 :-

→ Design a hybrid topology with a star backbone and 4 ring networks :-



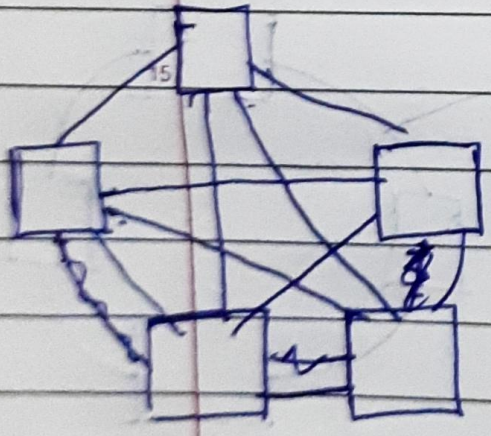
→ A hybrid topo. with ring backbone and three bus network



→ Number of cable links in each topology:-

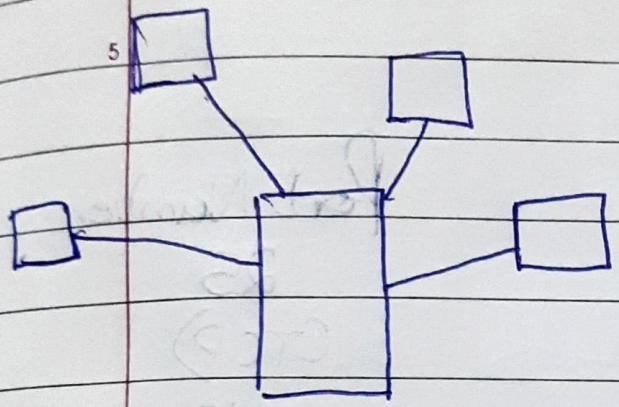
- Mesh - $\frac{n(n-1)}{2}$ $n \rightarrow$ no. of devices
- Ring - n
- Star - n
- Bus - n+1
  ↳ for the backbone cable

→ 5 devices arranged in a mesh topology,



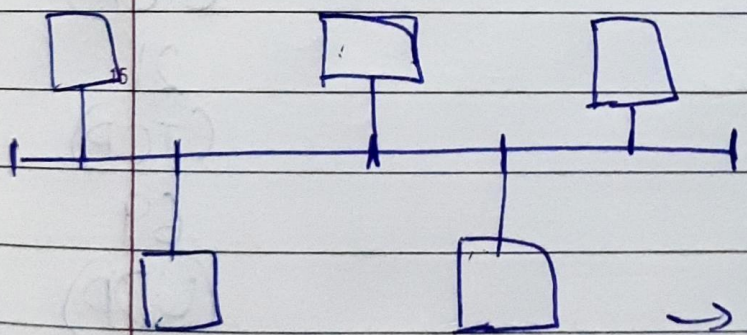
Here, if any one of the connection fails then only devices physically connected to the failed connection are disconnected and that too only between themselves rest of the network stays the same and 2 devices connected to the diconnected link are connected to the entire network except the disconnected device. This is possible due to a dedicated point-point connection in this topology.

→ 4 devices connected in a star topology (Excluding the hub)



Here if one connection fails (except the hub) only a single device to which the faulty link was attached to is ~~disco~~ disconnected, rest of network is intact.

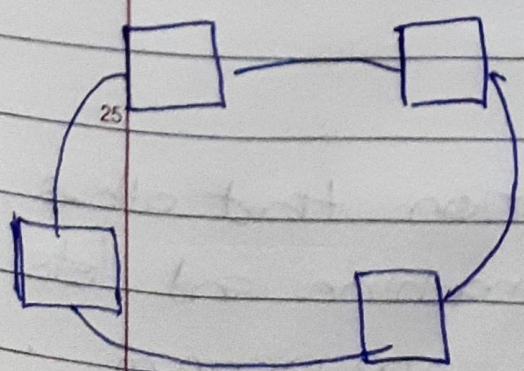
→ 5 devices arranged in a bus topology.



→ If the dropline link is faulty only one device is disconnected

→ If the backbone cable is faulty the whole network is disrupted.

→ 4 devices arranged in a ring topology :-



- If any one of the link goes ~~faulty~~ faulty the whole network is ~~drupted~~ disrupted.

Task-2

→ Simplex Duplex — Half Duplex — Full-Duplex

eg. Keyboard, Monitor — Walkie-Talkie — Telephone

Task-3

→ Application layer Protocol	Port Number
SMTP (Simple Mail Transfer Protocol)	25 (TCP)
POP3 (Post office protocol)	110 (TCP)
Telnet	23 (TCP)
HTTP (Hypertext transfer protocol)	80 (TCP)
FTP (file transfer Protocol)	21 (TCP)
TFTP (Trivial file transfer Protocol)	69 (UDP)

SMTP

- used for e-mails.
- TCP/IP protocol that supports e-mail on the internet is SMTP.

TELNET

- it is client-server application that allows a user log onto remote machine and lets the user to access any app program or a remote computer.

FTP

- standard mechanism provided by TCP/IP for copying file from one host to another.

- establishes 2 connections between hosts:
  - Data Connection and Control Connection.

Port 20	Port 21
↓	↓
used for control over information	used for data ~~cont~~ transfer.

POP3

- protocol used by a mail server in conjunction with SMTP to recieve and holds mail for hosts

HTTP

- protocol used mainly to access data on the World ~~Web~~ Wide Web

HTTPS

- port no. 443

Name | Page
Date / /

Task 3

ARP	R-ARP
- Address Resolution protocol	- Reverse Address Protocol
- Thrugh ARP, receiver's IP add → MAC add (32 bits) (48 bits)	- Thrugh R-ARP, receiver's Mac add → IP add (48 bits) (32 bits)
- In ARP, broadcast macaddress is used.	- In RARP, broadcast IP add. is used.
- ARP, Hosts and routers use it to know the mac address of other hosts and routers in the network.	- While RARP is used by small users having less facilities.

Task-4

(VPR) Virtual path Routing :-

- a protocol used in adhoc wireless networks
- provides highly dynamic, correct and efficient paths creation and maintenance between nodes.
- utilizes a technique to monitor the mobility of nodes and factorises it in operations.

- It is distributed, on-demand and adaptive protocol that comprises two phases.
  - Discovery:-
    VPR discovers and creates a virtual path between source and destination.
  - Maintenance:-
    protocol monitors the usability of all active paths.

→ Virtual Circuits
- means of transporting data over a packet-switched network in such a way that it appears as though there is a dedicated physical link between source and destinatio

- connection oriented service.
- highly reliable medium of data transport.
- but are costly to implement.

- Transmission path:-
- a communication channel that carries the information from the sender to the reciever.
- data is transmitted in the form of electromagnetic signals.
- main functionality is to carry info in form of bits through LAN.

Delays

- Propagation Delay :- (D/S)
  - the time that it takes for a bit to reach from one end of a link to the other.
  - The delay depends on the distance (D) the sender and reciever and the propagation speed of the coaxe signal.

→ Transmission delay

- time it takes to transmit a data packet onto the outgoing link. The delay is determined by the size of packet and the capacity of the outgoing link.

$\left(\frac{L}{B}\right)$ L → amounts of bits

→ Queuing delay

- refers to the time that a packet waits to be processed in the buffer of a switch.
- the delay is dependent on the arrival rate of the incoming packet, the transmission capacity of the outgoing link, and the nature of the networks traffic.

→ Processing Delay

- it is the time taken by a switch to process the packet header. The delay depends on the processing speed of the switch.