Sender reciever
Application layer
Presentation layer
Session layer
Transport

Unit

data { Application layer → use for Interaction (Sender, reciever)
↓ ↑
Presentation layer → Encryption, Decryption
↓ ↑
Session layer → Session stablish, Synchronaisation
↑ ↓
Segment → Transport layer → End to End, Error Control
↑ ↓
Packets → N/w → IP address/logic, error control
↑ ↓
Frames → data link layer → physical address
Bits → Physical layer →

Q.1 Explain Issues of network layer?

Issue of N/w layer :-

Neural Network layer ⇒

It is concern with getting packets from the source all the way to the destination with minimal cost.

It is lowest layer that deal with end to end transmission.

issues ⇒

1. Stored & forwarded packets. ⇒

→ A host with packet to send transmit it to the nearst router

→ the packet is stored there until it is arrive.
→ The link has finished its processing by verifying the over checksum.
→ then it is forworded to the next router along the path until it stored & forwerd packets so issue of N/w layer is how to store & forwerd packets.

2. Services provided to transport layer ⇒
The service should be independent of router technology.
Transport layer should be sheilded from no., types topology of them router present.
→ The N/w address available to the transport layer should use a uniform no. plant event across LAN & VAN.

* Connection Oriented ⇒
Establish Communication
Data transfer.
Connection release

3. Implementation of connectionless service
Suppose that process P_1 has a long process P_2 it hands to the transport layer with interaction to deliever to the process P_2 on host h_2 the transport layer code run

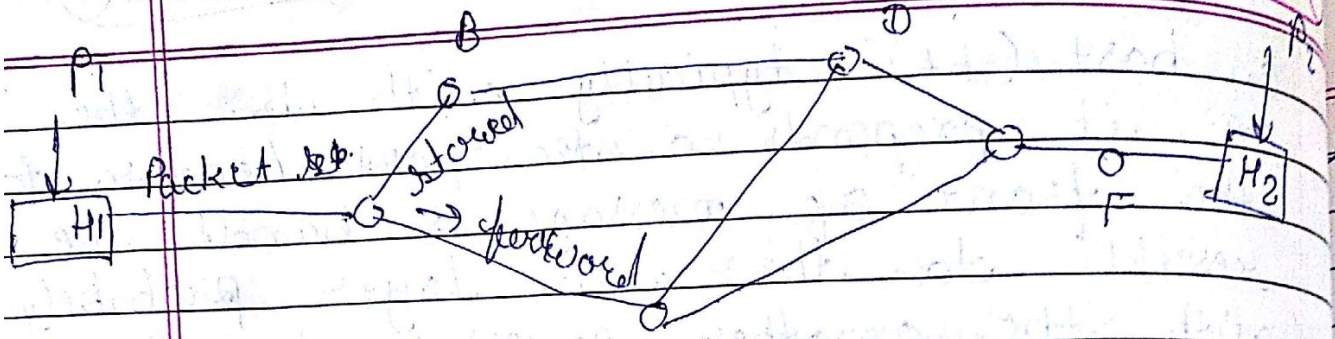
on host (ht) typically with in the o.s it prepends a transport header to the front of message & hands the result to the n/w layer probably with the another processor in the o.s.

* Implimentation of Connection oriented circuit =>

For Connection oriented service we need a virtual circuit N/w the idea behind virtual ckt to avoid having to choose a new routes for every packets send.

For Connection oriented service each packet carries an identifier which vertical ckt. belong to & assign different Connection identify to the outgoing traffic for the 2nd Connection.

Issues	Conectionless Datagram ckt	virtual ckt
⇒ Connection setup	No	Yes
⇒ Routing	Independent	all packets follow ckt
⇒ Quality of Service (QOS)	difficult	easy
⇒ Connection Control	difficult	easy



Q.2 What is routing? Explain Shortest path routing algo?

Routing ⇒

filling & updating routing

two concept of router

(1) forwarding ⇒

In this router looking the outgoing line to use for packet when arrives. & In updating all routing table are updating in each stage.

Now routing algorithm have some desirable property.

→ Correctness

→ Sould be simple → Simplicity

robustness ⇒

routing algo should be copy with change topology & traffic without aborted aborting or jobs.

→ Stability

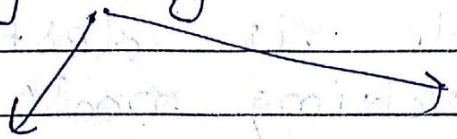
→ fairness

→ Optimality ⇒

It minimise the packet delay & maximise total n/w

Through-put - minimize the no. of hops to improve delay & through put.

Routing Algorithm ⇒



Non-adaptive (Static)

Adaptive (dynamic)

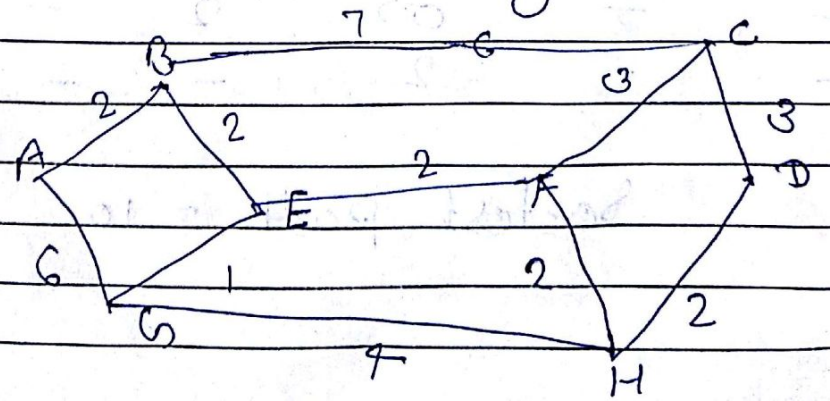
Non-adaptive ⇒

routing decision not based on mejorment or assetments of current traffic or topology & route is computed in advance. afline is downloded to the routers when n/w is booted.

Adaptive ⇒

It change the routing decision to reflect in topology & traffic also.

I Sh. sortest path algo



Algo :-

I Intially mark all nodes ∞ distance expept source node. working node is source node & sink node is destination node while working node ≠ sink node.

1. mark working node permanent.
2. Examine all adject node in turn.
3. Examine all node mark the smallest value in the path.
4. Examine all tentative node & mark all node smallest value as permament.
5. reconstruct the path backward sink to source.

	A	B	C	D	E	F	G	H
	∞	∞	∞	∞	∞	∞	∞	∞
AB	-	2	∞	∞	∞	∞	6	∞
ABC	-	-	7	∞	2	∞	∞	∞
ABE	-	-	∞	∞	-	2	∞	∞
ABEF	-	-	∞	∞	-	-	∞	2
ABEFH	-	-	∞	2	-	-	∞	-
ABEFHD	-	-	2	-	-	-	∞	-

Sortest path = 10

Explain distance vector routing?

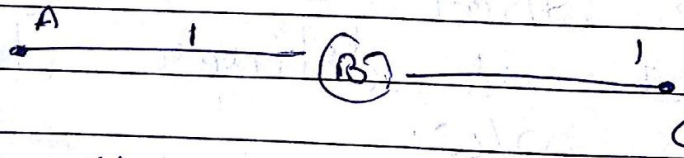
Distance vector Routing :- Adaptive

Drawback of Static routing ⇒ Current n/w load isn't take into a accou thats why we use distance vector routing. it is also called Ford - fulkerson and Ballman - ford.

How its work ⇒

→ 1st we take hopcount value. i.e no. of n/w cost.

→ cost is normally hopcount.



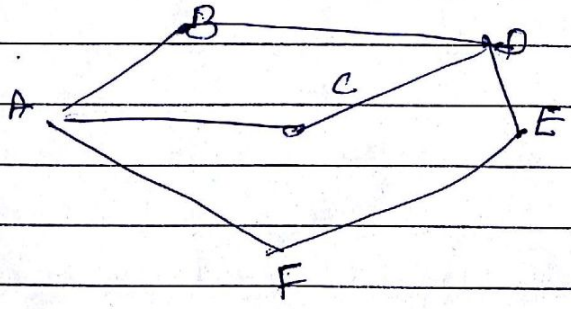
Hopcount of c = 2

Each router needs to update routing table asynchronously when it recieve information from.

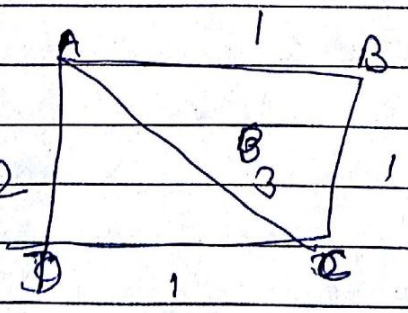
after update result is send to all neighbours. In this example if DE path is fly-over then (Cut down) then A again update the informat^n. send to packet F the F node is also known D to E link is cutdown.

each router should keep atleast three pieces of inform. for each destination n/w
cost n/w
hop n/w

Dest. n/w	cost	Next hop
C	2	B



Ans



Initially for A =>

Via A

	A	B	C	D
A	0	1	3	2
B	1	0	4	3
C	3	4	0	4
D	2	3	4	0

Via B

	A	B	C	D
A	0	1	2	3
B	1	0	1	2
C	2	1	0	4
D	3	2	4	0

Via C

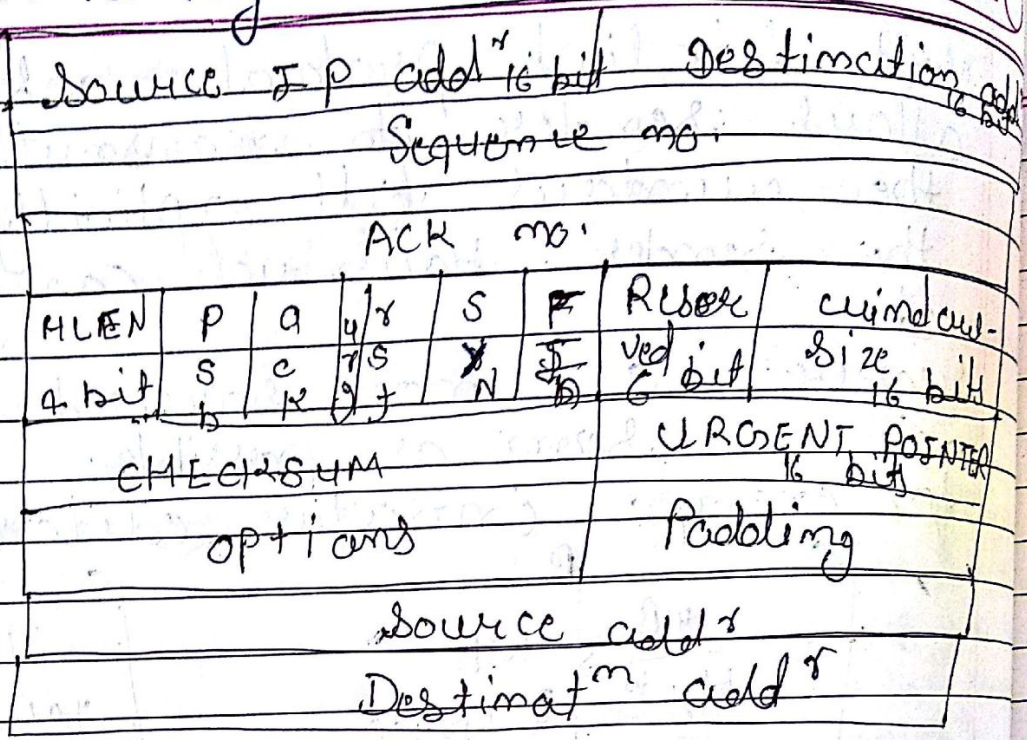
	a	b	c	d
a	0	4	2	3
b	4	0	1	2
c	2	1	0	1
d	3	2	1	0

Via d

	a	b	c	d
a	0	4	3	2
b	4	0	4	2
c	3	4	0	1
d	2	2	1	0

Q.4 Explain TCP segment header?

⇒



Source IP addr is indicate the source code no. & destinat^n code no. port no.

Sequence no. :-

32 bit no. use for byte level numbering of TCP segment.

ack no. ⇒

32 bit no. which is indicate next sequence no so that the sending device is expating from the other device.

HLEN ⇒

which is about that

for bit header specify the length of TCP header. TCP variable can be of variable length due to the tcp opt^n field. The min. bit header is 5 bit ie - 0101

reserved bit ⇒

It said to always set to 0. & its size 6 bits

window size ⇒

It used for flow control that used to indicate the no. of bytes that a receiver accept.

Control bits ⇒ flag ⇒

U.

urg :- urgent point
PSh :- request for push
rSt :- reset the connect^n
Sym :- Synchronize Sequence no.
FIN :- Terminate the process

the all bits govern the TCP connect^n establishment process

checksum :-

used to error control