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Course-Title :

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Ans. To The Ques. NO : 1(a)

ID = 1810146

$\therefore X = 6+1 = 7$

$\therefore Y = 4+1 = 5$

For Mesh Topology,

$$\text{Number of Links} = \frac{X(X-1)}{2}$$

$$= \frac{7 \times 6}{2} = 21.$$

For Star Topology,

Number of Links = Number of n-devices.

$= 5$

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In case of security, Mesh Topology is better than Star topology.

In mesh topology, each device is connected to every other device directly. There are point-to-point dedicated line between every devices. Data flow is carried by the specific Link. This makes the network more secure. As no other device can receive the data. Even physical boundaries prevent other devices from receiving the data. Even if one device fails it won't affect the whole network.

Star topology is also secured. Here data is sent via exchange through routers. But the main problem is if the routers damages all the datas will be lost.

So it is better to use Mesh topology in case of security.

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Ans. To The Ques No: 1(b)

If we have a channel with 1000 bps bandwidth, we can choose half-duplex mode.

If half-duplex mode, both device can transmit but one at a time. When one device transmits the capacity of the whole channel is taken by the sender device and then the other. ~~As~~

~~we have~~

If In full-duplex mode the capacity is divided into two links or the capacity is shared between two links.

As we have only 1000 bps bandwidth, if we choose full-duplex mode, this 1000 bps will be divided, as a result we won't be able to send more data at a time.

For this reason we will choose half-duplex to send more data at a time.

Advantage of full-duplex mode:

→ More than one devices can transmit at a time and no collision will occur.

Disadvantage of full-Duplex mode:

→ More bandwidth is needed.

Advantage of half-duplex mode:

→ Bandwidth can be utilize.

Disadvantage of half-duplex :-

→ If more than one device tries to transmit at a time collision will occure and data will lost.

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Ans. To the Ques. No: 4(a)

$X = 6 + 1 = 7$

$Y = 4 + 1 = 5$

∴ Bandwidth = 7 MHz.

SNR = $10 \times y = 10 \times 5 = 50$

∴ Capacity = $7\ MHz \times \log_2(50+1)$

$= 7\ MHz \times (5.672)$

$= 39.704$ Mbps.

∴ Appropiate bit rate is 39.704 Mbps.

Now,

Bit rate = 2 x bandwidth x $\log_2 L$

$\Rightarrow 38 = 2 \times 7 \times \log_2 L$

$\Rightarrow \log_2 L = \frac{38}{14} = 2.714$

$\Rightarrow L = 2^{2.714}$

$\Rightarrow L = 6.56.$

∴ Signal level is 6.56.

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Ans. To. The. Ques. NO: 4(b)

Difference between throughput and bandwidth:-

Throughput	Bandwidth
→ It is the ammount of data that is being ~~transferred~~ transmitted.	→ It is the maximum ammount of data that can be transmitted.
→ Throughput is calculated at a specific time.	→ Bandwidth is calculated during the whole network transmission.
→ Throughput can be ~~different~~ different at different time.	→ Bandwidth is fixed.
→ Throughput can't exceed bandwidth.	→ Ba

Throughput is the ammount of data that can be transmitted at a time. But bandwidth

is fixed which is the maximum range of data flow. If you have a network with 2 Mbps bandwidth, you can transmit data at maximum 2Mbps but ~~the~~ which means throughput can be at max 2 Mbps. But most of the times throughput remains less than bandwidth.

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Ans. To The Ques. No: 8(a)

$X = (6)^2 \bmod 6 = 0$

$Y = (4+1) \bmod 6 = 5$

∴ Sender PC = PC 0

∴ Receiver PC = PC 5

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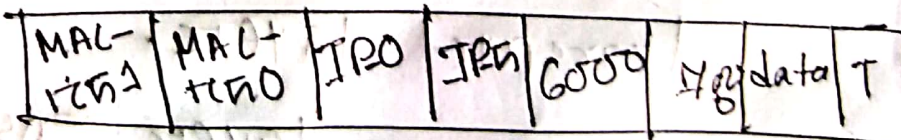
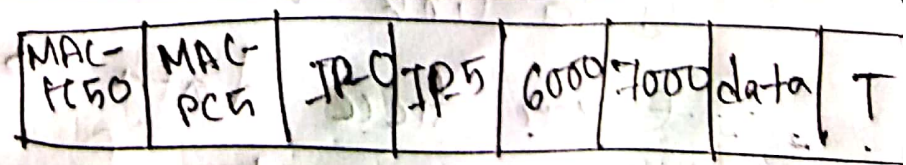
Port-no- of PC0 = 6000

port-no- of PC5 = 7000 (receiver)

Senders	Receivers	Packets.
PC0	R00	
R00	R01	
R01	R51	
R51	R50	
R50	PC5	

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Ans. To. The. Ques. NO: 2(b)

Data Link Layere ~~sent~~ is responsible for moving frames from one hop to the next.

At network layere errore control is performed at process to process.

But in data Link layere errore control is done ~~of~~ across a single link. That means, sender transport layere sends an errore free data at the receivers transport layere.

Data link layere ensures to send an error free data to the physical layer which is than transfers this correct data to the ~~sea~~ receiver's side.

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