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Sec : A

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Ans. to the ques no- 1 (a)

ID = 18101003

$$\therefore X = 3 + 1 = 4$$

$$Y = 0 + 1 = 1$$

For mesh topology I need $= 4(4-1)/2$

$$= 6 \text{ links}$$

6

For star topology I need $= n$ links

$$= 1 \text{ link}$$

If I were to choose between mesh and star for security purpose I'll choose star topology.

In star topology each device has a dedicated point to point link only to a central controller, usually

called a hub. For this we can send an information from one computer to a specific computer.

on the other hand in mesh topology every device has a dedicated point-to-point link to every other device so we can not send a information to a specific computer.

So, I'll choose star topology for a more secure network.

ⓑ

Half-duplex:

In half duplex mode each station can both transmit and receive but not at the same time.

Advantages:

Whole bandwidth can be utilised as at a time only one signal transmits.

Disadvantage :

The disadvantage in half-duplex mode is that the other device cannot send data at the same time.

Full-duplex :

Advantage :

No delays in communication as both can send and receive data simultaneously.

Disadvantage :

No proper bandwidth utilization as the same line is used for sending and receiving data at the same time.

Ans. to the que no-4

(a)

$$X = 3+1 = 4$$
$$Y = 0+1 = 1$$

$\therefore$ Bandwidth $= 4$ MHz

$$SNR = 10 \times 1 \, (1 \times 10)$$

$$= 100 \; ?$$

First we use the Shannon formula to find upper limit

$$C = \text{Bandwidth} \; \log_2 (1+ SNR)$$

$$= 4 \times \log_2 (1+100)$$

$$= 26.63 \; Mbps$$

$$26.63 = 2 \times 4 \, MHz \times \log_2 L$$

$$\Rightarrow \log_2 L = 3.329$$

$$\Rightarrow L = 2^{3.329}$$

$$= 10.04$$

Since this result is not power of 2, we need to increase the number of levels or reduce the bit rate.

⑥

Difference between bandwidth and throughput —

Bandwidth : This is a theoretical measure of how much data could transferred from source to destination.

Throughput : This is an actual measure of how much data is successfully transferred from source to destination.

No throughput can not be greater than bandwidth.

The bandwidth is the number of bits that can be sent on a link in one second. The throughput is the ammount of data sent.

So, bandwidth is always greater.

Ans. to the ques no- 2

$$X = (3)^2 \mod 6$$
$$= 9 \mod 6$$
$$= 3$$
$$Y = (3+1) \mod 6$$
$$= 4$$

A to B :

MAC of A	MAC of B	IP of A	IP of B	6000	7000	DATA

B to C:

MAC of	MAC of	IP	IP		6000	7000		DATA
B	C	B	C					

C to D:

4

MAC of C	MAC of D	IP C	IP D		6000	7000	DATA