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Mid-Semester Exam Spring-2020

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①

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Ans to the Q. No. 1 (a).

My ID is 16101122.

$$X = 2 + 1 = 3$$

$$Y = 2 + 1 = 3$$

⇒ In mesh topology:

$$\text{we need links} \Rightarrow N(N-1)/2$$

$$\Rightarrow 3(3-1)/2$$

$$\Rightarrow 3 \cdot 2 / 2$$

$$\Rightarrow 6 / 2$$

$$\Rightarrow 3$$

we need 3 links in mesh topology.

⇒ In star topology doesn't allow direct communication between devices, a device must have to communicate through hub. we need 1 hub and 3 links.

②

16/01/22

Difference between star and mesh topology:

Star

1. In star topology the nodes are connected to the central hub or router.

~~2. There are~~

2. The cost of star topology is less

3. The complexity of star is quite simple

4. In star topology, the information is travel from central hub to all the nodes

5) Star topology is very good extensible.

6) twisted pair cable is used for connection

7) Star topology is used in Lan as setup is easy

Mesh

1. In mesh, the nodes are connected to each other via dedicated link.

2. It is expensive.

3. The complexity of mesh is complex.

4. In mesh, the information is travel from nodes to nodes

5) It is not extensible.

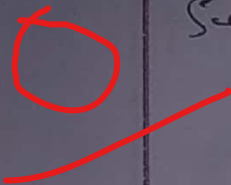
6) twisted pair coaxial cable and optical fiber cable are used for connection

7) Mesh topology is used in WAN.

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So I think star topology is more
secure than mesh topology.



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Ans to the Q. No. 04 (A)

Here

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$$\therefore x = 2 + 1 = 3$$

$$\text{and } y = 2 + 1 = 3$$

$$\text{SNR} = 10 \times 3 = 30$$

$$\text{Band width} = 3 \text{ MHz}$$

Now, we use shannon formula for finding the bitrate. —

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

$$= 3 \times 10^6 \times \log_2 (1 + 30)$$

$$= 3 \times 10^6 \times \log_2 31$$

$$= 3 \times 10^6 \times 4.95$$

$$= 14850000 \text{ bps}$$

$$= 14.85 \text{ Mbps}$$

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Now we use Nyquist formula for finding the signal levels

$$\text{Bit rate} = 2 \times \text{bandwidth} \times \log_2 L$$

$$\Rightarrow 14.85 = 2 \times 3 \times \log_2 L$$

$$\Rightarrow 2.475 = \log_2 L$$

$$\Rightarrow L = 2^{2.475}$$

$$\therefore L = 5.56$$

So, the appropriate bit rate is 14.85 Mbps and 5.56 signal levels.

⑤

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Ans to the Q. No. 4. (b)

⇒ Difference between bandwidth and throughput

Key	Bandwidth	Throughput
Definition	Data capacity of a channel which can be transferred in specific period of time	Actual measure of data transferred over a specific period of time
Measurement unit	Bits	Bits per sec
Objective	To transfer data	To communicate
Layer	physical Layer of OSI model	Any Layer of OSI model
Dependancy	No Dependancy	Dependent on latency
Impact	No impacted by physical destruction	Highly impact by external interference
Analogy	Speed of water coming out of tap in particular time frame	Actual water flown out of tap in particular time frame

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~~No, bandwidth is greater than throughput.~~

~~Yes, throughput can be greater than
Bandwidth as it helps to measure how fast
we can actually send data and it
depends on latency.~~