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Mid-Semester Examination: Spring 2020

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Ans: to the question No: 01 (a)

For x computers:

My ID is 17201072

Now $x = 2 + 1 = 3$.

A mesh network with n nodes has $n(n-1)/2$

$$\therefore 3(3-1)/2 = 3 \text{ links.}$$

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For y computers:

ID is 1701072

$$\therefore \text{Now } y = 7 + 1 = 8$$

star topology has 8 link connected.

I chose between these two topologies
I will prefer star topology is the best
performance.

① If N devices are connected to each other in star topology, then the number of cables required to connect them is N . So, it is easy to set up.

② Each device requires only 1 port. For example: to connect to the hub.

(iii) Less ~~Ans~~ to expensive, robust.

Ans: to the question No: 01 (b)

Half-duplex :

Advantage: (i) Whole bandwidth can be utilised as at a time only one signal transmits.

Disadvantage: (i) A half-duplex mode is that the other device can not send data until it receives the data which is already in pipe.

in transmission, this can cause delays to the communication.

Full duplex

Advantages (i) No delays in communication as

both can send receive data simultaneously.

Disadvantage: (i) No proper bandwidth utilization as the same line is used for sending and receiving data at the same time.

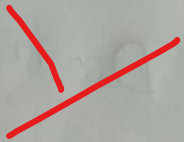
Ans to the question No 02

Soln: My ID is 17201072.

$$\therefore X = 2^2 \bmod 6 = 4 \bmod 6 = 4.$$

$$\therefore y = (4+1) \bmod 6 \\ = 5 \bmod 6$$

$$= 5$$



Ans: to the question No: 2(b)

Data Link Layer: The data link layer is responsible for moving frames from one hop to the next. It transforms the physical layer to a reliable link.

Here are the Data Link Layer's Duties.

- i) Framing
- (ii) physical addressing
- (iii) Flow control
- (iv) Error control
- (v) Access control.

Transport Layer:

The transport layer is responsible for delivery of a message from one

process to another.

Here, Transport Layer & Duties.

- (a) Service-point addressing
- (b) Segmentation and reassembly.
- (c) Connection control.
- (d) Flow control.
- (e) Error Control.

Ans to

p.f.o

Ans: to the question No: 4(a)

Solⁿ: My reg. ID is = 17201072

Now $x = 2 + 1 = 3$

$$y = 7 + 1 = 8$$

SNR for this channel is ~~10 * 8~~ (~~8 * 10~~)

~~$$= 80 \times 80$$~~

~~$$= 6400$$~~

~~$$= 10 \times 8$$~~

~~$$= 80$$~~

$$x = 3 \text{ MHz}$$

So, we use the Shannon formula to find our upper limit.

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

$$= 3 \times 10^6 \log_2 (1 + 80)$$

$$= 3 \times 10^6 \log_2 (81)$$

$$= 57.79 \text{ Mbps}$$

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Then we use the Nyquist Formula to Find the number of signal levels.

$$4 \text{ Mbps} = 2 \times 3 \text{ MHz} \times \log_2 L$$

$$\Rightarrow 4 \text{ Mbps} = 6 \times \log_2 L$$

$$\Rightarrow L = 0.6$$

Ans: to the question No: ⑤

The throughput is an actual measure of how much data is successfully transferred from source to destination, and bandwidth is theoretical measure of how much data could be transferred from source to destination. Throughput measures speed while bandwidth is only indirectly related to speed.

To put it another way, bandwidth provides you with a theoretical measure of the maximum number of packets that can be transferred and throughput tells you the number of packets that are actually being successfully transferred. As a result, throughput is more important than bandwidth as a measure of network performance.

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