

Data Communication

& Networking

Assignment 02
(BN)

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Question no 01:-

Data :-

Distance = 100 m

Speed = 3×10^8 m/s

Propagation delay = ?

Vulnerable time = ?

Solution :-

$$\text{Propagation delay} = \text{Distance} / \text{speed}$$

$$= \frac{100}{3 \times 10^8}$$

$$= \frac{1}{3 \times 10^6}$$

$$= 0.333 \times 10^{-6} \text{ sec}$$

$$= 0.333 \text{ } \mu\text{s}$$

As in CSMA

vulnerable time = Propagation delay

so

vulnerable time = 0.333 μs

Question no 02:-

Part 1 :-

$$\text{Propagation delay} = \frac{\text{distance of cable}}{\text{travelling speed}}$$

$$= \frac{3000}{3 \times 10^8}$$

$$= 0.00001 \text{ sec}$$



$$= 1 \times 10^{-5} \text{ sec}$$

Part B :-

Transmission time = $\frac{\text{frame size}}{\text{transmission rate}}$ Bandwidth

$$= \frac{1024}{20 \times 10^6 \text{ bps}} \\ = 5.12 \times 10^{-8} \text{ sec}$$

Part C :-

$$\text{Efficiency} = \frac{1}{(1 + 6.4 \times a)}$$

$$a = \frac{P_p}{T_t}$$

$$= \frac{1 \times 10^{-5}}{5.12 \times 10^{-8}} \\ = 0.195$$

$$\text{show efficiency} = \frac{1}{(1 + 6.4 \times (0.195))}$$

$$= 0.44 \\ = 44\%$$

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Question no 03:-

Part (a) :-

$$\text{Data Rate} = \text{no of employees} \times \text{file size} \times \text{no of time per sec}$$

$$= 200 \times 10 \times 10^6 \times 8 \times \frac{20}{8 \times 60 \times 60}$$

$$= 1111111.11 \text{ bps}$$

Part (b)

$$\text{load} = \text{no employee} \times \text{Rate}$$

$$= 25 \times 500 \text{ Kbps}$$

$$= 12500 \text{ Kbps}$$

OR

$$= 25 \times 500000 \text{ bps}$$

$$= 12500000 \text{ bps}$$

$$= 125 \times 10^{-6} \text{ Mbps}$$

Part (c)

With 200 employees on the internet, considering 10 Mbps; each user should get 500000 bps which means that network needs to be updated

Question no 04:-

Hub	Switch
1) Single Collision domain	Multiple Collision domain
2) Layer 1 device	Layer 2 device
3) Hub is on physical layer	Switch is on data link layer
4) Hub is half duplex transmission	Switch is full duplex transmission.
5) In hub message is send to all devices	In Switch, it determine and send message to selected destination.
6) It is not intelligent hence it is reliability inexpensive	It is intelligent device so. it is expensive.

Switch is use in order to minimize broadcast since in hub message is send/transmit to all devices but switch are intelligent enough to determine destination where to send message thus it increase efficiency and decrease broadcast.

Question no 05:-

Go Back N:-

Receive window = 1

Sender window = $2^5 - 1 = 31$

Stop & Wait:-

Receive window size = 1

Sending window size = 1

Selective Repeat:-

In Selective repeat protocol, sending and receiving window size is same and should be greater than 1

maximum sending & receiving window size
= $\frac{2^5}{2}$ (one half of 2^5)

= 16