

### 1\* A base band bus of length 1 km operations at 10 Mbps. What is $t_0$ .

time required to send a frame of 1000 bits from a station at one end of

the bus to the other end of the bus

Cable length = 1 km, R= 10 Mbps, Size of frame=1000 bit

=  $T_x$

Size

R

=

1000

$T_p \leq 4 \times 10^{-6} = 10^{-6} \times 10$

=  $T_p$

$4 \times 10^{-6}$

2

$5 \times 10^{-6} \times 5 =$

### 2: Choose the correct answer .

A. Content errors in a frame are detected by

- i. LLC sub-layer
- ii. MAC sub-layer
- iii. physical layer

B. A station on the LAN

- i. MAC address
- ii. LLC address
- iii. Network address

### 3\* Explain in detail CSMA/CD protocol

When two frames collide, the medium remains unstable for the duration of transmission of both damaged frames. For long frames transmission time compared to propagation time, the amount of wasted capacity can be considerable. This waste can be reduced if "a station continues to listen to the medium while transmitting". This leads to the following rules

Medium is Idle, transmit; otherwise goto step 2

Medium is busy, listen and repeat step 1

Collision detected during transmission, station stop transmitting and

transmits jamming signal to ensure that all stations know that there has

been a collision

After transmitting jamming signal, wait random time then repeat step 1

## 5\*What are the main functions of the following fields of the MAC :frame of IEEE 802.3 LAN

Preamble -

Start frame delimiters(SFD) -

Length(L) -

\* Preamble: enable bit synchronization, consists of 7 bytes and each equal to

"binary pattern "10101010

\*SFD: marks the start of the frame, consists of 1 byte long unique bit pattern

"10101011"

\*L: indicates the number of bytes in the data field, consists of 2 bytes long

## Compare between "10 base2" and "10 base5" LANs from the :point of view

Bit rate -

Segment length -

Number of stations per segment -

Type of transmission medium -

Bit Rate// Segment Length // # of stations // Type of trans. medium

10base2 //10 Mbps //200 m // 30 // Thin Coax

10base5 /10 Mbps //500 m //100 // Thick Coax 10

what is the relation between "frame transmission time" and "end-to end propagation delay" for proper collision detection

Transmission time  $\geq 2 \times$  Propagation delay [ $T_x \geq 2 T_p$ ]

Explain in detail the function of "I/G" bit and "U/L" bit of .8 the destination address of MAC frame of Ethernet

I/G: indicates whether the address is individual or group address -1 (means that frame will be accepted by all members of the group)

U/L: indicates whether the address pertains to universal addressing scheme administered by IEEE or it is locally administered address

I/G 0 --> individual address

group address <-- 1

U/L 0 --> global administered address by IEEE

locally administered address <-- 1