Name : Sumit Kumar Yadav

Roll No. : 18CS30042

Answer 1:

Roll no. :18CS30042

ASCII-ENCODED = 18CS42

18CS42

1: 0000000000011111

8:0000000000100110

C: 0000000000101011

S: 0000000000110101

4: 0000000000100010

2: 0000000000100000

At the sender end,

Sum : 0000000000011011

Check sum : 1111111111100100

Receiver

Answer 2:

a.

Source IP = 10.0.0.1

Destination IP = 10.0.1.1

Source MAC = 00:01:95:9d:68:16

Destination MAC = 00:b7:91:8d:12:0a

b.

Source IP = 10.0.1.2

Destination IP = 10.0.1.1

Source MAC = 00:A0:C9:14:C8:29

Destination MAC = 00:1B:44:11:3A:B7

c. Since, R1 uses the ARP protocol to find the destination MAC address of the packet.
so the ARP Request is broadcasted in the network with broadcast IP address 255.255.255.255 and

broadcast MAC address FF:FF:FF:FF:FF:FF

Now, Once the destination device receives the ARP Request message where the target protocol address matches with its own IP address if this happens then it sends back an ARP reply with its MAC address at the target hardware address.

Answer 3:

Roll no. :18CS30042

Therefore, (42%4)+1 = 3

⇨ 3 Gbps cable

Length of cable = 1km

Signal speed = 200000 km/sec

Since in CSMA/CD for a station to get successful transmission the contention interval should have atleast 2*a slot width where a is the time for the signal to propagate between 2 farthestmost stations .

That means that there must be enough time for the front of the frame to reach the end of cable and thus the error message to be sent back to the start before the entire frame is transmitted.

Therefore, for 1 km cable the one way propogation time = 1/200000 = 5 * (10)^(-6) = 5 micro second

⇨ for both ways it would be 2*5 = 10 micro second
Now , to make CSMA/CD work, it will be impossible to transmit an entire frame in this interval.
Therefore,
Minimum frame size for cable = $3 * 10^{9} * 10 * 10^{(-6)}$
$= 3 * 10^4$ bits
Now the frame size for cable in bytes = $(3 * 10^4) / 8$
= 3750 bytes.
So, the conclusion is at 3 Gbps all frames shorter than $(3 * 10^4)$ bits can be completely transmitted in under 10 micro seconds so the minimum frame is $(3 * 10^4)$ bits or 3750 bytes.