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**Section : EAR**

**Second Assignment**

**Total grades 4**

Answer The following questions.

**Question 1:**

In a block of addresses, we know the IP address of one host is 225.134.12.59/18.

What are the first address (network address) and the last address (limited broadcast address) in this block? [1 mark]

first address (network address)= 225.134.0.0

last address (limited broadcast address) = 225.134.63.225

**Question 2:**

An organization is granted the block 211.17.180.0/25. The administrator wants to create 8 subnets. [ 1 mark]

1. Find the number of addresses in each subnet.

2^4=16

1. Find the subnet mask.

255.255.255.240

c. Find the first and last addresses in subnet 1.

>first address = 211.17.180.0

>last address = 211.17.180.15

**Question 3:**

Suppose the stations on a wireless pure ALOHA network transmit 500 bit frames on 500 kbps channel.

Find the value of backoff time TB for K=2. [1 mark]

Convert from Kbps to bit

500 kbps= 500000 bit

TB = R \* Tfr

Tfr = L/R

Tfr = 500bit / 500000 bit = 1 \* 10^-3 s

Convert from S to milliseconds : (1 \* 10^-3 s )1000 = 1ms

K=2 :

2^k -1 =2^2 -1 =3

the range is {0,1,2,3} 0 (1ms) = 0 ms

0 (1ms) = 0ms

1 (1ms) = 1ms

2 (1ms) =2ms

3 (1ms) = 3ms

backoff period of K= 2 is 0,1,2,3

**Question 4:**

In a CSMA/CD network with a data rate of 10 Mbps, the minimum size of a frame is 64 bytes the propagation speed is 2 x 10^8 m/s. What is the maximum distance between any two stations? [1 mark]

Data rate = 10 Mbps --->10^7 bps

propagation speed = 2 x 10^8 m/s

minimum size of a frame = 64 bytes ---->64\*8=512 bits

maximum distance = (512 \* 2 x 10^8)/ (2)\*(10^7) = 5120 m