

Computer Networks

Medium Access Control

DPP 01

[MCQ]

1. In ethernet, the source address field in the MAC frame is the _____ address.
- Original sender's Physical
 - Previous station's Physical
 - Next destination Physical
 - Original sender's Service

[MCQ]

2. After the k^{th} consecutive collision, each colliding station waits for a random time chosen for the interval_____.
- $(0 \text{ to } 2^k) \times \text{RTT}$
 - $(0 \text{ to } 2^k - 1) \times \text{RTT}$
 - $(0 \text{ to } 2^k - 1) \times \text{maximum propagation Delay}$
 - $(0 \text{ to } 2^{k-1}) \times \text{maximum propagation Delay}$

[NAT]

3. A group of N stations share 50 Kbps slotted ALOHA channel. Each station outputs is 500 bits frame on an average of once 5000ms, even if previous one has not been sent. What is the maximum value of N?

[MCQ]

4. Suppose that 'N' ethernet stations, all trying to sent at the same time, requires $\frac{N}{2}$ slot times to sort out who transmits next. Assuming the average packet size is 5 slot times, express the utilization of ethernet as a function of N.
- $\frac{10}{N}$
 - $\frac{10}{5 + N}$
 - $\frac{5}{N + 10}$
 - $\frac{10}{10 + N}$

[MSQ]

5. Which of the following is NOT true about slotted ALOHA?
- Divide time into discrete intervals.
 - Require global time synchronization
 - Does not divided time into discrete intervals
 - None of the above

Answer Key

- | | |
|-----------------|----------|
| 1. (b) | 4. (d) |
| 2. (b) | 5. (b,c) |
| 3. (368 to 368) | |



Hints & Solutions

1. (b)

While the IP Address of source and the destination in a datagram is kept same at each hop, the source MAC address is replaced at each station while the frame is in transit. So for the current station, the source address field will contain the MAC address of the previous station.

2. (b)

Option 'b' is correct option.

3. (368 to 368)

5000×10^{-3} sec.....500 bits

1 sec..... $\frac{500}{5000 \times 10^{-3}}$ bits

1 sec.....100 bits

Throughput each station = 100 bits/sec.

Through put of slotted ALOHA = 0.368×100 Kbps

So,

$N \times$ through put of each station = $0.368 \times 100 \times 10^3$ bit/sec.

$N \times 100$ bits/sec. = 368×100 bits/sec.

$N = 368$

4. (d)

$$\text{Utilization} = \frac{\text{Utilization time}}{\text{Total time}} = \left(\frac{5}{5 + \frac{N}{2}} \right) = \frac{10}{10 + N}$$

5. (b,c)

Slotted ALOHA divides time into discrete intervals and it does not require global time synchronization.



Any issue with DPP, please report by clicking here:- <https://forms.gle/t2SzQVvQcs638c4r5>

For more questions, kindly visit the library section: Link for web: <https://smart.link/sdfez8ejd80if>



PW Mobile APP: <https://smart.link/7wwosivoicgd4>