Consider the Pure ALOHA, Slotted ALOHA, and Non-persistent CSMA. Which one will you use at high load? Why?

Ans: I will use Non-persistent CSMA. At high load there would be more transmission attempts, Non-persistent CSMA senses the channel before sending and causes fewer collisions than Pure ALOHA and Slotted ALOHA. So Non-persistent CSMA has best performance at high load.

Ten thousand airline stations are competing for the use of a single slotted ALOHA channel. The average station makes 18 requests/hour. A slot is 125 micro-sec. What is the approximate total channel load?

Ans. Average requests for 10000 stations = 10^4 x 18 / (60 x 60) = 50 requests/sec
Average slots number = 1 / (125 x 10^-6) = 8000 slots/sec.
Total channel load = average requests / average slots number
= 50 / 8000 = 0.0625
Hence, the total channel load is 0.0625 request/slot.

* CSMA used is standard Ethernet.
* Why Frame Transmission Time is 2x Tp in CSMA/CD.

vulnerable time in CSMA/CD is Tp

Frame transmision time is $T_{fr} = 2 \times T_p$

because to detect collision in CSMA, medium will wait upto transmission of last bit and it will wait twice of propagation time other wise frame is delivered or collided after Tp time if can not be determined. So waiting time to detect collision is doubled propagation time. There is no acknowledgement in CSMA/CD.