1. Explain the need for different types of MAC layer protocols like ALOHA, CSMA, CSMA-CA and CSMA-CD.

2. Assume that you are designing a CSMA-CD MAC layer protocol with the following parameters:
   a) Maximum separation between stations 100m
   b) Bit-rate 1 Gpbs
   c) Speed of propagation 250 million meters/sec

Specify other parameters of the system. What is the efficiency? How is it affected by the packet size?

3. A satellite which serves 100 stations has a maximum up-link capacity of 100 Mbits/sec. Stations send 1000-bit packets. Derive the efficiencies of plain ALOHA and slotted ALOHA for this scenario. Does the efficiency change if the packet size is 500 bits?

4. Explain the hidden station problem and the exposed station problem in the CSMA-CA. How are they addressed in MACA and MACA-W?