CSN 341 - Assignment 1

1. Describe the different wireless technologies you use during the day and their characteristics. If you have a choice between multiple technologies, why do you prefer one over another?
2. Suppose users share a 2 Mbps link. Also suppose each user transmits continuously at 1 Mbps when transmitting, but each user transmits only 20 percent of the time.
    a) When circuit switching is used, how many users can be supported?
    b) For the remainder of this problem, suppose packet switching is used. Why will there be essentially no queuing delay before the link if two or fewer users transmit at the same time? Why will there be a queuing delay if three users transmit at the same time?
    c) Find the probability that a given user is transmitting.
    d) Suppose now there are three users. Find the probability that at any given time, all three users are transmitting simultaneously. Find the fraction of time during which the queue grows.
3. Assume that we have created a packet-switched internet. Using the TCP/IP protocol suite, we need to transfer a huge file. What is the advantage and disadvantage of sending large packets?
4. What happens when you use cables longer than the prescribed length in a network?
5. Explain the difference between circuit switching and packet switching. Describe a scenario where packet switching would be more efficient than circuit switching and vice versa.