CSUS
COLLEGE OF ENGINEERING AND COMPUTER SCIENCE
Department of Computer Science

CSc/CpE 138 Computer Networks and Internets

Chapter #1 (Intro to Computer Networks)

Do the following problems in Chapter 1 of Kurose and Ross Text

Q1 (R4) List six access technologies. Classify each one as home access, enterprise Access, or wide-area wireless access

Q2 (R12) what advantage does a circuit-switched network have over a packet-switched network?

Q3 (R23). List the 5 layers in the Internet protocol stack? What are the principal responsibilities of each of these layers?

Q4

P8. Suppose users share a 3 Mbps link. Also suppose each user requires 150 kbps when transmitting, but each user transmits only 10 percent of the time. (See the discussion of packet switching versus circuit switching in Section 1.3.)

a. When circuit switching is used, how many users can be supported?

b. For the remainder of this problem, suppose packet switching is used. Find the probability that a given user is transmitting.

c. Suppose there are 120 users. Find the probability that at any given time, exactly n users are transmitting simultaneously. (*Hint*: Use the binomial distribution.)

d. Find the probability that there are 21 or more users transmitting simultaneously.

Q5

P21. Consider Figure 1.19(b). Now suppose that there are M paths between the server and the client. No two paths share any link. Path k ($k = 1, \ldots, M$) consists of N links with transmission rates $R_1^k, R_2^k, \ldots, R_N^k$. If the server can only use one path to send data to the client, what is the maximum throughput that the server can achieve? If the server can use all M paths to send data, what is the maximum throughput that the server can achieve?