KFUPM - COMPUTER ENGINEERING DEPARTMENT

COE-341 – Data and Computer Communication

Quiz 06 – Take home quiz – Due June 7th, 2009 – in class.

Problem: Consider the two back-to-back links AB and BC shown in Figure. The following specifies the information for each of the links:

Link AB: distance = 4000 km; propagation = 5 μsec/km, protocol = stop-and-wait, R_{AB} = unknown.

Link BC: distance = 2000 km; propagation = 5 μsec/km, protocol = sliding window protocol with W = 7, R_{BC} = 200 kb/s.

Assume Tack and Tproc are negligible. Data frames are 1000 bits long.

a) **(30 points)** For link BC, calculate the efficiency, the throughput in bits per second, and the throughput in frames per second?

b) **(20 points)** Calculate the minimum rate that link AB should have so that it does not cause frames to overflow at node B.

c) **(bonus 20 points)** Plot the throughput of link AB in frames per second as a function of the link transmission rate R_AB in bits/sec. Take R_AB to be anywhere from 0 to 1 Mb/s. Let the x-axis for the plot be R in kb/s.