Homework 3 – Computer Networks (Due 11/6/08)

Present problems in order with numbers 1 through 9 as given.

Chapter 4 Peterson/Davie

1. Problem 36
2. Problem 37
3. Problem 40
4. Problem 44
5. Problem 45
6. Problem 49
7. Problem 52
8. Apply Dijkstra’s algorithm to find the shortest path from A to F in the following network. (Build the table like the one we did in class to show the results of each step.)

9. Suppose hosts A and B are connected via three intermediate routers as shown:

Each time that a packet is transmitted from A to B, the probability that it is successfully forwarded at each router is \( p \) and the probability that it is lost (discarded) is \( 1 - p \). If the packet is lost, it times out at A and is eventually retransmitted.
   a. What is the expected number of hops that a packet makes per transmission (from A) until it either is discarded or arrives safely at B?
   b. What is the variance of the number of hops that a packet makes per transmission (from A) until discarded or arriving at B?
   c. What is the expected number of transmissions (from A) until the packet arrives at B?