Introduction to Computer Networks

Midterm Exam#1

April 26, 2002

1. In your own words, describe the principal responsibilities for each of the five layers in the Internet protocol stack. (15%)
2. What is a “best-effort network?” (7%) Explain why the Internet is a best effort network. (8%)
3. Explain why a persistent TCP connection is used in HTTP/1.1 for web accessing. (7%)
4. State the reasons that a streaming video application uses UDP as its underlying transport protocol. (8%)
5. Consider the cross-country example shown in Fig. 3.17. How big would the window size have to be for the channel to be fully utilized? (10%)
6. Consider the Go-Back-N and selective-repeat protocols. Suppose the sequence number space is [0, 1, 2, … , k]. What is the largest allowable sender window that will avoid problems such as that in Fig. 3.26 on Page 206 of the textbook from occurring for each of these protocols? (20%)
7. We see that Reno TCP waits until it has received three duplicate ACK before performing a fast retransmit. Why do you think the TCP designers chose not to perform a fast retransmit after the first duplicate ACK for a segment is received? (10%) Why a fast recovery mechanism that essentially cancels the slow-start after a fast retransmission is used? (10%)
8. Explain why the Internet does not use the network-assisted congestion control? (15%)