Introduction to Computer Networks

Final Examination

June 20, 2000

1. What is the channel utilization of a satellite channel that operates at two megabits per second, if the stop-and-go protocol is used? (7%) Assume the round trip delay for the satellite channel is 0.3 second and the frame size is two kbytes. What is the optimal window size if a sliding window protocol is used? (8%)

2. Explain why the "slow start" and "congestion avoidance" phases are used in the TCP congestion control algorithm.(10%)

3. State at least two considerations that should be taken into account in designing a TCP protocol over wireless networks.(10%)

4. State the advantages of the public-key cryptography over secret-key cryptography?(7%) What are the shortcomings of the RSA algorithm for secure communication.(8%) How could you design an efficient secure communication scheme with the advantages of public-key cryptography and without its shortcomings.(10%)

5. State two occasions that the message digest is better used for message authentication. (10%)

6. Why a three-way handshake procedure is used in connection establishment in the transport layer?(10%)

7. Give two schemes by which the IP address depletion (shortage) problem can be avoided, at least temporarily. (10%)

8. Why an ATM cell is small and fixed? (7%) Why ATM technology is used in today's Wide Area Networks? (8%)