HOME WORK ASSIGNMENT#1

Due Date Feb 21, 2007 (10x100=1000 points)
CS 4/55201 COMPUTER NETWORKS
Spring 2008, Department of Computer Science, Kent State University

1. (Chapter 1, Problem P11) What are two reasons for using layered protocols?

2. (Chapter 1, Problem 18) Which of the OSI layers handles each of the following:
   (a) Dividing the transmitted bit stream into frames.
   (b) Determining which route through the subnet to use.

3. (Chapter 1, Problem 14) Two networks each provide reliable connection-oriented service. One of them offers a reliable byte stream and the other offers a reliable message stream. Are these identical? If so, why is the distinction made? If not, give an example of how they differ.

4. (Chapter 1, Problem 21) List two ways in which the OSI reference model and the TCP/IP reference model are the same. Now list two ways in which they differ

5. (Chapter 1, Problem 33) Make a list of activities that you do every day in which computer networks are used. How would your life be altered if these networks were suddenly switched off?

6. (Chapter 2, Problem 1) Compute the Fourier coefficients for the function f(t) = t (0 <= t <=1).

7. (Chapter 2, Problem 12) Multipath fading is maximized when the two beams arrive 180 degrees out of phase. How much of a path difference is required to maximize the fading for a 50-km-long 1-GHz microwave link?

8. (Chapter 2, Problem 18)A simple telephone system consists of two end offices and a single toll office to which each end office is connected by a 1-MHz full-duplex trunk. The average telephone is used to make four calls per 8-hour workday. The mean call duration is 6 min. Ten percent of the calls are long-distance (i.e., pass through the toll office). What is the maximum number of telephones an end office can support? (Assume 4 kHz per circuit.)

9. (Chapter 2, Problem 26) An ADSL system using DMT allocates 3/4 of the available data channels to the downstream link. It uses QAM-64 modulation on each channel. What is the capacity of the downstream link?

10. (Chapter 2, Problem 41) Three packet-switching networks each contain n nodes. The first network has a star topology with a central switch, the second is a (bidirectional) ring, and the third is fully interconnected, with a wire from every node to every other node. What are the best-, average-, and-worst case transmission paths in hops?

All problems are from Computer Networks, Andrew S Tanenbaum, Forth Edition. If there is any inconsistency please email TA (ydrabu@cs.kent.edu)