S-72.1130 Telecommunication Systems / Examination 3.2.2014

Answers to separate form.
Remember to state your name and student number. Answer each question with at most few sentences. No long stories, please. Total maximum score: 29 points.

1. **The following are well-known acronyms in IP communication. Explain what they mean and how they are used. (4p)**

   a) ARP

   b) DHCP

   c) MTU

   d) DNS

2. **Discuss the differences between circuit-switched and packet-switched networking. What benefits or disadvantages does one have over the other? (4p)**

3. **Discuss different forms of delay in packet switched network. Describe and characterize the different delay sources briefly (4p)**

4. **Consider a 10 Mbps Ethernet link that is 80 meters long. The Ethernet frame length is 512 bits.**

   a) What is the propagation delay on the Ethernet link? (you can assume that bit speed on wire is $2 * 10^8$ m/s) (1 p)

   b) What is the normalized bandwidth-delay product (in relation to frame length) on the Ethernet link between? (1 p)

   c) What is the efficiency of the Ethernet link? What does the efficiency tell about the MAC performance, and why is it not 100%? [Hint: 1 / (1 + 6.44a)] (3 p)

5. **What are fiber attenuation and fiber dispersion in optical networking, and how do they affect communication performance (4p)**

6. **Describe CSMA with Collision Avoidance, and its benefits in wireless LAN communication compared to plain carrier sensing (4p)**

7. **What is Point Coordination Function in Wireless LAN, and how does it relate to Distributed Coordination Function? (4p)**