HOME WORK ASSIGNMENT#2

Due Date October 25, 2007 (10x100=1000 points)

CS 4/55201 COMPUTER NETWORKS

Fall 2007, Department of Computer Science, Kent State University

1. (Chapter 3, Problem 8) A block of bits with n rows and k columns uses horizontal and vertical parity bits for error detection. Suppose that exactly 4 bits are inverted due to transmission errors. Derive an expression for the probability that the error will be undetected.

2. (Chapter 3, Problem 9) What is the remainder obtained by dividing $x^7 + x^5 + 1$ by the generator polynomial $x^3 + 1$

3. (Chapter 3, Problem 10) Data link protocols almost always put the CRC in a trailer, rather than in a header. Why?

4. (Chapter 3, Problem 13) Imagine a sliding window protocol using so many bits of sequence numbers that wraparound never occurs. What relations must hold among the four window edges and the window size?

5. (Chapter 3, Problem 25) A 100km long cable runs at the T1 data rate. The propagation speed in the cable is 2/3 the speed of light. How may bits fit in the cable?

6. (Chapter 3, Problem 29) PPP is based closely on HDLC, which uses bit stuffing to prevent accidental flag bytes within the payload from causing confusion. Give at least one reason why PPP uses character stuffing instead.

7. (Chapter 3, Problem 30) What is the minimum overhead in sending an IP packet using PPP? Count only the overhead introduced by PPP itself, not the IP header overhead.

8. (Chapter 4, Problem 2) Consider the delay of pure ALOHA versus slotted ALOHA at low load. Which one is less? Explain your answer.

9. (Chapter 4, Problem 3) Ten thousand airline reservation stations are competing for the use of a single slotted ALOHA channel. The average station makes 18 request/hour/ A slot is 125usec. What is the approximate total channel load?

10. (Chapter 4, Problem 10) The wireless LANs that we studied used protocols such as MACA instead of CSMA/CD. Under what conditions would it be possible to use CSMA/CD instead?

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