CDA 45000-10542: Introduction to Data Communications

Fall 2003   **Name:** _____

**Midterm 2**   **Last 5 digits of SSN**: xxx-x ___–___ ___ ___ ___

This is a CLOSED books/notes test. You are NOT allowed to consult any material you have brought into the classroom. NO exchange of information is allowed among students. If you find any question vague or ambiguous, make an educated assumption, write your assumption down, and solve the question under that assumption. Write your name and SS# on each sheet detached.

1. What will be the following bit pattern look like after **bit-stuffing**, as discussed in class, has been done? (15 pts.)

    0 1 1 1 1 1 0 1 0 1 1 1 1 1 1 1 1 0 0 0 1 1 1 1 1 1 0 1

2. Consider the following scenario in the GO-back-N ARQ: (10 pts.)
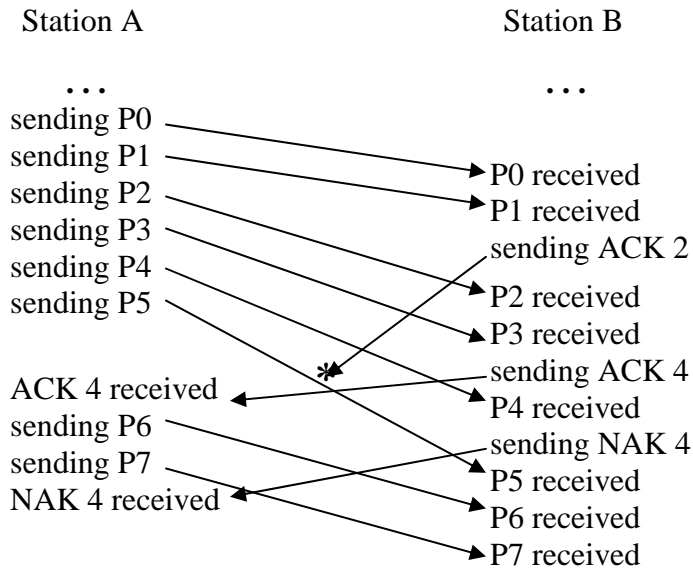
What action will Station A take in response to:

    a) missing ACK 2?

    b) NAK 4?

3. One way of detecting errors is to transmit data as a block of n rows of k bits per row and adding parity bits to each row and each column. However, there are cases that complementary errors may slip through the check without being detected. Show an example. (10 pts.)

4. A message is received as 1111000011011, and the common divisor is 100111. Is the message received correctly? Show work to support your answer. (20 pts.)

5. In *Selective Repeat ARQ*, the size of the sender and receiver window must be at most one-half of 2^m, where m is the number of bits used for sequencing frames. Show an example to support the above statement. Note: You may chose $m = 2$ for simplicity. (10 pts.)

6. The following PPP packet carries a Link Control Protocol payload. Fill in the blank fields with appropriate hexadecimal numbers. The table below shows the hexadecimal representations of four major protocols supported in PPP. (15 pts.)

				Payload and padding	FCS	
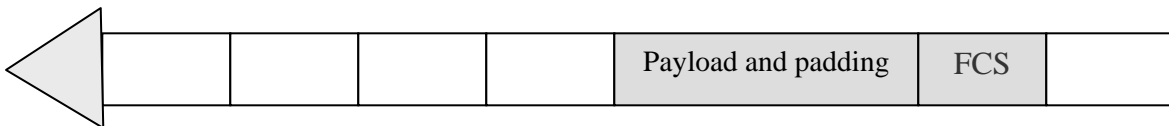
Code	Protocol Type
C021	Link Control Protocol
C023	Password Authentication Protocol
C223	Challenge Handshake Authentication Protocol
8021	Internetwork Protocol Control Protocol

7. Construct the Hamming code for the bit sequence 1010101. Show your work. (20 pts.)