UNIVERSITY OF TEXAS AT DALLAS Department of Electrical Engineering

EE/TE 4367 - Telecommunications Switching & Transmission Assignment #4

Date assigned:	2/14/2008
Date due:	2/21/2008

4.1 Using the symbols +,0, and – to represent a positive pulse, no pulse, and a negative pulse, respectively, determine the following line code sequences of the binary data sequence

011010000100011000000010

- (a) Bipolar with most recent pulse being positive
- (b) Bipolar with most recent pulse being negative
- (c) B3ZS with a +0+ substitution having just been made
- (d) B6ZS with the most recent pulse being positive.

4.2 What is the average pulse density of B3ZS coding?

4.3 Assume that crosstalk interference in a multipair cable system produces an effect equivalent to Gaussian noise at an equal power level. Using an error rate of 10^{-6} as a design objective, determine the effective degradation of the crosstalk on binary (polar) NRZ coding under each of the following conditions. (The effective degradation is determined as the increased transmit power, in decibels, required to achieve the desired error rate.)

(a) The crosstalk level is 16 dB below the average signal level, but the crosstalk is to be overcome on only one pair, (i.e., all other pairs stay at a power level for 10^{-6} BER with no corsstalk.)

(b) The crosstalk level is 16 dB below the average level, but, the effects of the crosstalk are to be overcome on all pairs. (Hint: Use signal-power-to-noise-power ratios, not Eb/No.