

PROBLEM 1

(a) Read Chaps. 3.1–3.5 from P & D.

(b) Read “Requirements for success in gigabit networking” by Samir Chatterjee (*Commun. ACM*, 40(7):64–73, 1997). Give a 1-page summary of the latter. Include your own viewpoints on whether you agree with the conclusions put forth in the paper. *Note: A copy of the paper can be found on reserve at the MATH Library. For off-campus students, copies of the papers have been sent to the site coordinators.*

PROBLEM 2

(a) Design a 1024-channel baseband (TDM) framing standard (similar to T1 for telephony) suited for carrying super-CD quality audio assuming a frequency range of 20Hz–20.02kHz. Assume a quantization level of 16 bits per audio channel and two framing bits (for synchronization) per frame. What is the data rate of your standard? What is the data rate per audio channel? What is the frame duration (i.e., time duration of each frame)?

(b) As a continuation of part (a), since the frame size for the super-CD audio standard is “not too small,” we may need to adopt a particular bit encoding scheme to facilitate ease of clock recovery and synchronization (beyond the two framing bits). What is the resultant bit rate of the standard when you use NRZI with 4B/5B encoding? Make sure to indicate which parts of the frame will be subject to encoding. Give a scheme that you can use which will recover the clock without increasing the bit rate. What, if any, problems are associated with your scheme?

PROBLEM 3

Problems 3.3, 3.4, 3.5, 3.7, 3.11, 3.12 from P & D.