ETSF05 Extra questions Tutorial 2.

1)
The information in four analogue signals is to be multiplexed and transmitted over a telephone channel that has a 400 - 3100 Hz bandpass. Each of the analogue baseband signals is band limited to 500 Hz. Design a communication system that will allow the transmission of these four sources over the telephone channel using TDM using PCM; assume 4-bit samples.

2)
Explain, in terms of data link control and physical layer concepts how error and flow control are accomplished in synchronous TDM.

3)
24 voice signals are to be multiplexed and transmitted over twisted pair. What is the bandwidth required for FDM? Assuming a bandwidth efficiency (ratio of data rate to transmission bandwidth) of 1 bps/Hz, what is the bandwidth required for PCM?

4)
Consider building a 1Gbps CSMA/CD network running over a 1km cable with no repeaters. Assume propagation is at 2x10 meters per second. What is the minimum frame size required?