

EE3700 - Communication I

Tutorial 4

1. If we are to record music (maximum frequency 20kHz say) as a digital signal, what is the minimum sample rate that can be used?
2. Calculate the maximum “hold” time that can be employed in a sample-and-hold system when used with a signal with a frequency range of 20Hz to 20kHz. Assume that the maximum amplitude errors should be less than 3dB.
3. A audio CD stores music as a 14bit sample at a sample rate of 40.1 kS/s.
 - a) Estimate the Signal to Noise Ratio (SNR) obtained if the signals are recorded at maximum level.
 - b) Estimate the amount of data stored on a 60 minute music CD.
 - c) Why is the sample rate used in practical CD players usually greater than the minimum predicted rate of 40kS/s?