Department of Electronics & Communication Engineering

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Digital Communication

Assignment-3

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1. Let $X_x(f)$ be the raised cosine spectrum with roll of factor α. Show that
$$\int_{-\infty}^{+\infty} X_x(f)df = 1$$
2. What is minimum bandwidth solution for pulse shape with zero ISI? Assume symbol duration be T
3. Given a bit sequence of 01011001 draw line code in NRZ-L, NRZS.
4. For the binary sequence 110101101 construct NRZ, RZ, AMI & Manchester format.
5. What is ISI? Give Nyquist criterion for zero ISI and raised cosine spectrum.
6. Write a short note on raised cosine spectrum.
7. Prove that the output signal of a matched filter is proportional to a shifted version of the autocorrelation function of the output signal to which the filter is matched.
8. Write short note on Matched Filter.
9. A raised cosine pulse spectrum for a roll of factor ($\alpha = 1$) is given by
$$P(f) = \frac{1}{2B_o} cos^2(\frac{\pi f}{4B_o}), \quad 0 \le |f| \le 2B_o$$
$$= \quad 0, \qquad\qquad 2B_o \le |f|$$
Show that the time response $P(t)$ of above spectra is
$$P(f) = \frac{Sinc(4B_o t)}{1 - 16{B_o}^2 t^2}$$
10. Write down error of probability for different unipolar signaling.