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# 10EC61 – Digital Communication

## Assignment-II

Note: **i) Write the assignment in a A4 size paper**  
**iii) Mention your USN, name and section on the top right corner of first page**  
**ii) Submit the assignment on or before 11.00 AM, Friday, 21/04/2017**

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1. With neat waveform and block diagrams, explain the DPCM transmitter and receiver. Obtain the expression for prediction gain.
2. Consider a low-pass signal with a bandwidth of 3.4-KHz. A linear modulation system with step-size of 0.1V is used to process this signal at a sampling rate 7 times the Nyquist rate. **i)** Evaluate the maximum amplitude of a test sinusoidal signal of frequency 1.5KHz, which can be processed by the system without slope overload distortion. **ii)** For the specifications given in part (i), find the o/p SNR under **Pre-filtered** and **Post-filtered** condition.
3. Sketch Bipolar RZ, Polar NRZ, Manchester, 8-ary NRZ format waveforms for the data 100010101.
4. Derive an equation for power spectral density of Manchester Format.
5. Derive an expression for signal to quantization noise power ratio for delta modulation assuming no slope overload distortion.
6. Sketch BPSK transmitter. Derive an expression for probability of error in BPSK.
7. With suitable waveforms and block diagrams, explain Delta modulation and its advantages and disadvantages.
8. Derive an expression for power spectral density of unipolar NRZ format.
9. With suitable waveforms and block diagrams, explain Adaptive Delta Modulation and mention its advantages.
10. a) Briefly explain:
  - i) Two advantages of using Manchester format over unipolar NRZ format.
  - ii) T1 to T4 Carrier systems.