Code No: C3EC01 **05**

III B.Tech.(CCC) Supplimentary Examinations, June 2008
ANALOG AND DIGITAL COMMUNICATIONS
(Electronics & Communication Engineering)

Time: 3 hours **Max Marks: 100**

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Explain the operation of a non-linear detector with relevant circuit diagram and waveforms.
   (b) Explain the operation of a linear detector with relevant circuit diagram and waveforms. [10+10]

2. (a) In FM, the side bands at equal distance from f_c, have equal amplitude- Explain.
   (b) What are the differences between FM and PM?
   (c) What are the differences between NBFM and WBFM? [11+5+4]

3. Explain the SNR's at Input and output of demodulators of DSB-SC and SSB-SC and compare them. [20]

4. (a) Explain how the PPM signals can be generated and reconstructed through PWM signals.
   (b) Compare the merits and demerits of PAM, PDM and PPM signals. List out their applications. [12+8]

5. (a) Prove that impulse response of the modified duo-binary filter consists of two sine functions that are time-shifted by 2 T_p seconds, and sketch its response.
   (b) A source emits one of three equiprobable symbols in an independent sequence at a symbol rate of 1000 bps. Design a three level PAM system to transmit the output of this source over an ideal lowpass channel with additive Gaussian noise having a PSD of $\eta/2 = 10^{-14}$ Watt/Hz. The symbol error probability has to be maintained at or below 10^{-6}. Specify the power, bandwidth requirements and H_T (f), H_R (f) P_g(t). [10+10]

6. (a) A sinusoidal signal with maximum peak input voltage of 5v is applied to a PCM Channel using 10-bit code word. Find
      i. The number of quantization levels used.
      ii. The RMS quantization
      iii. The maximum sinusoidal signal to quantization noise ratio in dB.
   (b) A PCM system is to carry a 20kHz-music channel. It is to have an SNR of 80dB and peak maximum signal is 15dBover its RMS value.
      i. What sampling rate should be used.
      ii. How many bits should be used in the sample code word? [10+10]

7. Explain the working principle of PSK and discuss its various phase states like BPSK, DPSK, QPSK. [16]

8. (a) What is meant by random errors and burst errors? Explain about a coding technique which can be used to correct both the burst and random errors simultaneously.

   (b) Discuss about the various decoders for convolutional codes. [12+8]

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