

END TERM EXAMINATION

FOURTH SEMESTER [B.TECH.]– MAY 2008

Paper Code: ETEC208

Subject: Communication Systems and Circuits

Paper ID: 26208

(Batch: 2001-2003)

Time : 3 Hours

Maximum Marks : 75

Note: Attempt five questions in all including Q.No.1 which is compulsory.

- Q.1 (a) Distinguish between amplitude modulation and angle modulation techniques. (3)
- (b) State and explain aperture effect as a result of sampling the signal. (3)
- (c) Give the important properties of power spectral density and explain. (3)
- (d) What is mutual information and how it relates to channel capacity. (3)
- (e) What is the significance of prediction filter and where it is employed? (3)
- Q.2 (a) Discuss any one method of generating DSBSC AM signal and discuss the demodulation with synchronous detector. Draw the signal in time and frequency domain. (8)
- (b) The power content of the carrier and of an AM Signal is 5KW. Determine the power content of each sidebands and the total power transmitted when the carrier is modulated up to 75%. (7)
- Q.3 (a) State and prove sampling theorem for band pass signals. (8)
- (b) Explain the detection of FM signal by Foster-Seelay discrimination method. Give suitable phasor diagrams. (7)
- Q.4 (a) Explain the demodulation technique of Pulse Width Modulation (PWM) and Pulse Position Modulation (PPM). (8)
- (b) Consider a random process $x(t)$ given by $x(t) = A \cos(\omega t + \theta)$ where ω and θ are constants and A is as random variable. Determine whether $x(t)$ in Wide sense stationary WSS). (7)
- Q.5 (a) Discuss and explain Differential Pulse Code Modulation (DPCM). Discuss the advantages of DPCM over PCM. (9)
- (b) What is known as non-uniform quantization, and give its practical significance. (6)
- Q6 (a) Explain the generation and detection of DPSK (Differential Phase Shift Keying) signal with the help of transmitter and receiver block diagrams. (9)
- (b) What is known as Quadrature Amplitude Modulation (QAM)? Explain the benefits of QAM. (6)
- Q7 (a) State and explain Shanon's source coding theorem. How it helps in removing redundancy of source information? (5)
- (b) A DMS emits symbols with probabilities 0.22, 0.18, 0.17, 0.15, 0.13, 0.1, 0.05. Construct Huffman code. Find the average codeword length and entropy of the source. Compare both results and comment. (10)
- Q8 Write short notes on any three of the following:- (3x5=15)
- (a) MATCHED FILTER
- (b) Quadrature Phase Shift Keying (QPSK)
- (c) Lempel-Ziv Coding
- (d) Narrowband Frequency Modulation (NBFM)
