Total No. of Questions : 10] [Total No. of Printed Pages : 3

Roll No. .....

CS/EE/IT/BM–405(N)

B. E. (Fourth Semester) EXAMINATION, June, 2011

(Common for CS, EE, IT & BM Engg. Branch)

ANALOG AND DIGITAL COMMUNICATION

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 35

Note : Attempt *one* question from each Unit. All questions carry equal marks.

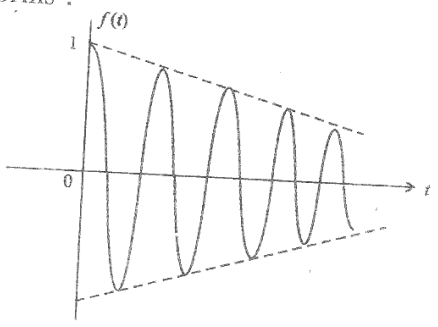
Unit – I

1. (a) Show that the Fourier transform of a Diac comb is Diac comb itself.

   (b) State and prove Parseval's theorem.

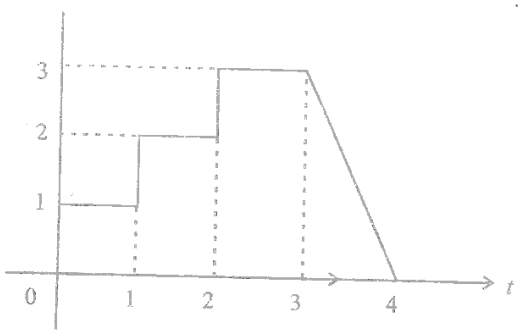
Or

2. (a) Determine the Fourier transform of the following waveforms :



(a)

P. T. O.



(b)

(b) Determine the impulse response of ideal low pass filter.

Unit – II

3. (a) Discuss the synchronization techniques for overcoming the errors due to synchronous detection.

(b) Determine the expression of NBFM and compare its performance with AM.

Or

4. (a) Discuss the phase discrimination method for SSB generation.

(b) Discuss indirect method for generating FM. Also discuss the Bandwidth requirement of WBFM.

Unit – III

5. (a) Determine the channel bandwidth required for transmitting N number of PAM-TDM signal.

(b) With the help of block diagram explain the generation of Delta modulated signal.

Or

6. (a) Explain what is quantization ? What is quantization noise ? How can it be reduced ?

(b) Discuss the need of ADM. With the help of block diagram explain its working.

Unit – IV

7. Discuss the generation and detection of DPSK signal. Also discuss about its probability of error and Bandwidth required.

Or

8. Discuss the generation and detection of QPSK signal. Also throw light on its probability of error and Bandwidth required.

Unit – V

9. (a) Determine the information carried by a channel with independent input and output.

(b) Consider a (7, 4) block code generated by :

$$G = \left[\begin{array}{cccc:ccc} 1 & 0 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 0 & 1 & 0 & 1 \\ 0 & 0 & 0 & 1 & 1 & 1 & 1 \end{array}\right]$$

Explain how the errors syndrome S helps in correcting a single error.

Or

10. (a) Determine the channel capacity of the Gaussian channel. Also discuss the S/N and Bandwidth trade off.

(b) Apply the Shannon-Fano coding procedure for the following message ensemble :

$$X = [x_1 \quad x_2 \quad x_3 \quad x_4 \quad x_5 \quad x_6 \quad x_7 \quad x_8]$$

$$P = [1/4 \quad 1/8 \quad 1/16 \quad 1/16 \quad 1/16 \quad 1/4 \quad 1/16 \quad 1/8]$$

Take M = 2.