ANNA UNIVERSITY COIMBATORE

B.E. / B.TECH. DEGREE EXAMINATIONS : MAY / JUNE 2010

REGULATIONS : 2007

SIXTH SEMESTER : ECE

070290071 - DIGITAL COMMUNICATION

TIME : 3 Hours　　　　　　　　　　　　　　　Max.Marks : 100

PART – A

(20 x 2 = 40 MARKS)

ANSWER ALL QUESTIONS

1. Find the Nyquist rate and Nyquist interval for the signal g(t) = sinc 200t.
2. What is Delta modulation?
3. Determine the SNR of PCM system if the number of quantization levels is 2^8 ?
4. Differentiate uniform and non-uniform quantizer.
5. Compare PAM and PCM.
6. What is Intersymbol interference? Explain
7. What is an ideal Nyquist channel?
8. Give the application of Raised Cosine channels.
9. Compare the probability of error of PSK with that of FSK.
10. What is the need for bit synchronization?
11. Draw the ML partitioning space for BFSK.
12. What is bit error probability?
13. What are Hamming codes?
14. Mention the properties of cyclic codes.
15. What are Reed Solomon codes?
16. Define spread spectrum.
17. What is anti-jam?
18. Slow hop FH/MFSK system has number of bits/MFSK symbol as 4 and number of MFSK symbols/hop as 5. Calculate processing gain of the system.
19. What is frequency hopping spread spectrum?
20. Sketch the model of spread spectrum communication system.

PART – B

(5 x 12 = 60 MARKS)

ANSWER ANY FIVE QUESTIONS

21. A sinusoidal signal is transmitted using PCM. An output SNR of 66.7 dB is required. Find the number of representation levels required to achieve this performance.

22. a　Explain the STDM and ASTDM with neat illustrations.　　　　6

　　b　Derive the expression for quantization error due to DM.　　　6

23. a　Derive the condition for Nyquist criterion for zero ISI.　　　6

　　b　Write short notes on Correlative coding.　　　6

24. a　Explain briefly about FSK system with a neat signal space diagram.　6

　　b　In a PSK system, the received waveforms S1(t)=A coswt and　6
　　　　S2(t)= -A coswt are coherently detected with a matched filter. The value of A is 20mV and the bit rate is 1Mbps. Assume that the noise power spectral density h/2=10-11W/Hz. Find the probability of error Pe

25. a　Derive an expression for error probability of a BPSK system.　　8

| b | Compare the performance of BPSK and BFSK. | 4 |

26. a Explain Viterbi decoding algorithm in detail with an example. 6

   b For a (2,1,3) convolution code with g1 = (1 0 1 1) and g2 = (1 1 1 1), 6
      design the encoder and find the following.
      (i) Generator matrix
      (ii) Transfer function matrix Compute the coded output using both the
      methods assuming the input u = (101101).

27. a Describe Trellis coded modulation in detail with an example. 6
    b Derive an expression for Jamming margin for direct sequence spread 6
       spectrum system with BPSK modulation

28. a Discuss the method of generation and properties of Pseudo Noise 6
       sequences in detail.
    b An PN sequence is generated using a feed back register of length m = 8. 6
       The chip rate is 127 chips per sec. Find the length, chip duration and the
       period of the PN sequence

*****THE END*****