ANNA UNIVERSITY
UNIVERSITY DEPARTMENTS
B.E./B.Tech. DEGREE END SEMESTER EXAMINATIONS, NOV/DEC 2011
Information Technology
Third Semester (Regulations – 2008)
EC9212 Communication Techniques

Time: 3 hrs   Max. Marks : 100

Answer ALL Questions

Part-A (10x2=20 Marks)

1. Draw the spectrum of amplitude modulation (DSBFC).
2. What is the bandwidth of narrow band FM and wide band FM?
3. Write the significance of time division multiplexing over frequency division multiplexing.
4. What is the need for adaptive delta modulation?
5. Define 'baud rate' in digital communication.
6. Mention two observations from eye pattern.
7. Write the properties of entropy.
8. Why do we go for convolution codes?
9. Define processing gain of spread spectrum.
10. Compare TDMA, FDMA, CDMA

Part-B (5x16=80 Marks)

11. (i) With a neat block diagram describe the principle of superhetrodyne receiver and also mention its advantages.   (8)
(ii) Derive the expression of frequency modulation and also write its advantages and disadvantages.   (8)

12. (a) (i) Explain the principle of modulation which has a standard bit rate of 64kb/s.   (10)
(a) (ii) Discuss the working of differential pulse code modulation.   (6)

(OR)

12. (b) (i) Describe the operation of the modulator which has adaptive predictor and adaptive quantizer.   (8)
(b) (ii)With a neat block diagram discuss the working of channel vocoder.   (8)

13. (a) (i) Obtain the scheme of digital modulation and demodulation which has only 0° and 180° phase difference.   (8)
(a) (ii) Describe the principle of DPSK modulation and demodulation scheme and also write the output of modulator and demodulator for the given data, 1 0 1 1 1 0 0 0 1 1 0.
(8)

(OR)

13. (b) Derive the condition for the absence of ISI during digital communication and also explain with suitable example. Derive how this ISI can be minimized using duobinary coding techniques.   (16)

14. (a) (i) A zero memory source contains symbols from the alphabet, X={x1, x2, x3, x4} with P(X) = {1/2, 1/4, 1/8, 1/8}. Determine the 2nd extension of the source. Show that $H(X^2)$ = 2H(X)   (10)

(a) (ii) Discuss source coding theorem (6)

(OR)

14. (b) (i) Construct (7,4) cyclic code for the message sequence (1 1 0 1) and the generator polynomial g(x) $1+x+x^3$ (i) using the algorithm find the codeword (ii) find the generator matrix and parity check matrix (12)

(b) (ii) Derive the expression of syndrome decoding for cyclic codes (4)

15. (a) Obtain the PN sequence for the system shown in figure 5, where the initial state of the system is 1 0 0 0 0. Also write its properities. (16)
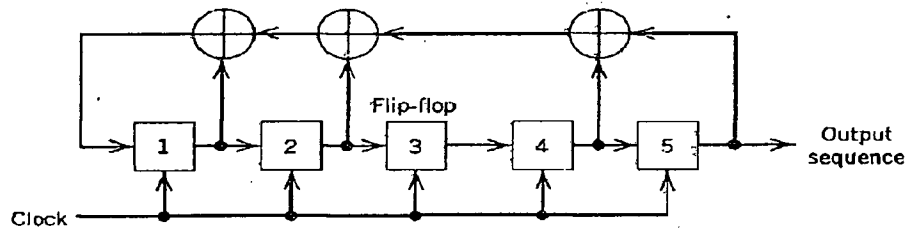

Figure 5

(OR)

15. (b) Obtain the advantages of frequency hop spread spectrum and describe the principle of slow and fast frequency hop spread spectrum transmitter and receiver using M-ary frequency shift keying. (16)