B.E/B.Tech. DEGREE EXAMINATION, APRIL/MAY 2010
Third Semester
Computer Science and Engineering
CS2204 - ANALOG AND DIGITAL COMMUNICATION
(Regulation 2008)

Time: Three hours Maximum: 100 Marks

Answer ALL Questions
PART A- (10 x 2 = 20 Marks)

1. In a Amplitude modulation system, the carrier frequency is $F_c = 100$ KHz. The maximum frequency of the signal is 5 KHz. Determine the lower and upper side bands and the bond width of AM signal.
2. The maximum frequency deviation in an FM is 10 KHz and signal frequency is 10 KHz. Find out the bandwidth using Carson's rule and the modulation index.
3. Draw the ASK and FSK signals for the binary signal $s(t) = 1011001$.
4. What are the advantages of QPSK?
5. Define Nyquist sampling theorem.
6. For the signal $m(t) = 3\cos 500^t + 4\sin 1000^t$, Determine the Nyquist sampling rate.
7. What is meant by ASCII code?
8. Which error detection technique is simple and which one is more reliable?
9. What are the applications of spread spectrum modulation?
10. Design processing gain in spread spectrum modulation.

PART B- (5 x 16 = 80 Marks)

11. (a) (i) Distinguish between FM and PM by giving its mathematical analysis. (8 Marks)
(ii) Derive the relationship between the voltage amplitudes of the side band frequencies and the carrier and draw the frequency spectrum. (8 Marks)

(Or)

(b) (i) Discuss about the sets of side bands produced when a carrier is frequency modulated by a single frequency sinusoid. (8 Marks)
(ii) In an AM modulator, 500 KHz carrier of amplitude 20 V is modulated by 10 KHz modulating signal which causes a change in the output wave of $+_7.5$ V. Determine:
1) Upper and lower side band frequencies
2) Modulation Index
3) Peak amplitude of upper and lower side frequency
4) Maximum and minimum amplitudes of envelope. (8 Marks)

12. (a) What is known as Binary phase shift keying? Discuss in detail the BPSK transmitter and Receiver and also obtain the minimum double sided Nyquist bandwidth. (16 Marks)

(Or)

(b) (i) Illustrate the concept of 8 QAM transmitter with the truth table. (8 Marks)
(ii) What is the need for carrier Recovery? Explain the Costas loop method of carrier recovery. (8 Marks)

13. (a) (i) What is called companding? Briefly discuss the Analog companding. (8 Marks)
   (ii) Discuss about the causes of ISI. (8 Marks)
   (Or)
   (b) (i) Explain in detail the Delta modulation transmitter and Receiver. (10 Marks)
   (ii) Discuss the drawbacks of delta modulation and explain the significance of adaptive delta modulator. (6 Marks)

14. (a) (i) Describe the most common error detection techniques. (12 Marks)
   (ii) Discuss the function of a data modem. (4 Marks)
   (Or)
   (b) (i) Explain in detail the characteristics of IEEE 488 Bus. (10 Marks)
   (ii) Briefly explain the three methods of error connection. (6 Marks)

15. (a) (i) What is a Pseudo noise sequence? What are the properties of Pseudo noise sequence? (8 Marks)
   (ii) Describe the application of CDMA in wireless communication system. (8 Marks)
   (Or)
   (b) (i) With a block diagram explain, DS spread spectrum with coherent binary PSK. (10 Marks)
   (ii) Explain the near-far problem in spread spectrum modulation? (6 Marks)