

B.E. COMPUTER SCIENCE AND ENGINEERING
SECOND YEAR
SECOND SEMESTER EXAM 2018 (Old)
DATA COMMUNICATION SYSTEMS

Time : Three hours

Full Marks : 100

Answer any five questions.

1. What does the sampling theorem tell us concerning the rate of sampling required for an analog signal? What is the significance of Fourier analysis? State Nyquist theorem. What key factors affect channel capacity? 5+5+5+5=20
2. What does decibel measure mean? Describe different categories of noise. What are reasons for different types of distortions of signals? 4+8+8=20
3. Describe the steps of Pulse Code Modulation technique in detail. Describe AM and FM techniques for modulation of analog signals. 10+10=20
4. Discuss Time Division Multiplexing (both synchronous and asynchronous). What is the major disadvantage of synchronous Time Division Multiplexing? How is it overcome in asynchronous Time Division Multiplexing? 10+5+5=20
5. Discuss the disadvantages of NRZ digital-to-digital encoding technique. Encode the following data streams using (a) RZ and (b) Manchester encoding techniques – a) 1010000110 b) 0101010101. 8+6+6=20
6. Describe the constellation diagrams for an ASK (OOK), BPSK, and QPSK signals. How QPSK can be implemented? What is Hamming distance? What is minimum Hamming distance? 10+5+3+2=20
7. Compare between Unshielded Versus Shielded Twisted-Pair Cable. What are the different propagation modes in wireless propagation? Write advantages of geo-stationary satellites. 5+10+5=20
8. Compare Forward Error Correction and Retransmission methods. Geometrically describe what should be the minimum Hamming distance to correct t errors. Which of the following CRC generators guarantee the detection of a single bit error?
 - a. $x^3 + x + 1$
 - b. $x^4 + x^2$
 - c. 1
 - d. $x^2 + 1$ 6+6+8=20