B.E./B.Tech.(Full Time) DEGREE END SEMESTER EXAMINATION APRIL/MAY 2011

Electronics and Communication Engineering

Fifth Semester

EC9301 Digital Communication Techniques

(Regulation - 2008)

Time: Three hours   Maximum ; 100 Marks

Answer all questions

Part- A (10x2=20 marks)

1. Draw the unipolar NRZ and Manchester coded waves for the binary sequence [1 0 1 1 0 0 1 ....]

2. What is pulse shaping? and write its importance.

3. List any four synchronization techniques used in digital communication.

4. What is the need for equalization?

5. Define entropy and specify its unit.

6. Differentiate source coding and channel coding

7. What is soft decoding and hard decoding techniques?

8. Define Hamming weight and Hamming distance.

9. What is MAP rule?

10. What is LDPC?

Part-B (5x16=80)

11. a) With neat block diagram, explain the duo binary and modified duo binary coding schemes. Derive and discuss the spectral characteristics of the coder output and principle of decoding.

12. a) Discuss about (i) early-late timing synchronization and (ii) anyone method of carrier synchronization technique

OR

b) Discuss briefly about the (i) Zero forcing equalization and (ii) LMS based equalization

13. a) Consider a source emits 6 symbols $\{x_i, i=1,2,...,6\}$ with the probability { 0.1, 0.2, 0.5, 0.05, 0.05, 0.1}. Then,

(i) find the codeword of the symbols if they are coded by Shannon-Fano coding (6)

(ii) find the codeword of the symbols if they are coded by Huffman coding (6)

(iii) Compare the redundancy associated with these two coded outputs (4)

OR

b) (i) Briefly discuss about BSC and BEC channels (6)

(ii) If BSC channel has transition probability 0.1 for the transition 0->1, then find the capacity of the channel (10)

14. a) Briefly discuss about the linear shift register based encoder and decoder of a cyclic code. Explain its operation with a suitable example.

OR

b) With an suitable example, explain the operation of convolutional coder and Viterbi hard decision decoding.

15. a) With suitable diagrams, explain the trellis coded modulation

OR

b) With suitable example, briefly explain the turbo coder