B.E / B.Tech (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2014

ELECTRONICS AND COMMUNICATION ENGINEERING

VI Semester

EC382 DIGITAL COMMUNICATION

(Regulation 2004)

Time: 3 Hours   Answer ALL Questions   Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Draw the eye pattern for 2ary scheme and discuss about its main features.

2. Write the Nyquist Criterion in frequency domain for pulse shaping to realize ISI free transmission.

3. What do you infer from the constellation representation of a signal.?

4. List the properties of the orthonormal basis signal.

5. Define entropy. Calculate the entropy of the BSC.

6. State Shannon's Channel capacity theorem.

7. Define syndrome and co-set leader.

8. Differentiate systematic and non systematic codes.

9. List the applications of spread spectrum techniques.

10. Define processing gain and jamming margin.

Part – B (5 x 16 = 80 marks)

11. Draw the block diagram of 5 tap linear traversal equalizer and explain the LMS algorithm to update the weights.(10)
    ii) Explain the Zero forcing algorithm and discuss about its pros and cons.(6)

12. a) With required block diagram explain BPSK modulator and demodulator. Also derive the bit error probability of BPSK demodulator.
    OR
    b) With required block diagram explain MSK modulator and demodulator. Also compare the power spectral density curves of MSK and QPSK.

13. a) A DMS has six symbols x1,x2,x3,x4,x5,x6 with probability of emission 0.2, 0.3,0.11, 0.16, 0.18, 0.05 encode the source with Huffman and Shannon – fano codes compare its efficiency.

b) Derive the mutual information I(x;y) for a binary symmetric channel, when the probability of source is equally likely and the probability of channel p=0.5. (8)
Derive the mutual information I(x;y) for a binary Eraser channel, when the probability of source is equally likely.(8)

14. a) For a (7,4) linear cyclic block code with generator polynomial $g(D)=1 + D +D^3$,
a)Obtain all the codewords and find out the error correcting capability (4)
b)Design the encoder and syndrome decoder and explain. (12)

OR

b) For a (2,1,3) convolutional code with generator sequence $g_1 = (101)$ and $g_2 =(111)$, design the encoder and represent it on a trellis diagram (8
ii)Explain Viterbi decoding algorithm for the above code. (8)

15. a) With suitable block diagram and waveforms, explain the working principle of
i) Direct sequence spread spectrum system and ii) Frequency Hopping spread spectrum system.

b) Construct a PN sequence generator for maximum length of 15 sequence and prove its properties .

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