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Question Paper Code: 50445

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2017

Fourth Semester

Electronics and Communication Engineering

15UEC405 - DIGITAL COMMUNICATION

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. A source delivers symbols m_1 , m_2 , m_3 and m_4 with probabilities $1/2$, $1/4$, $1/8$ and $1/8$ respectively. The entropy of the system is
(a) 1.7 bits/sec (b) 1.75 bits/symbol (c) 1.75 Symbols (d) 1.75 Symbol/bit
2. To guarantee detection of up to s errors in all cases, minimum hamming distance in a block code must be
(a) S (b) $s+1$ (c) $s-1$ (d) 0
3. Which type is used and preferred in digital logic circuits?
(a) NRZ-L (b) NRZ-M (c) NRZ-S (d) None of these
4. The detection method where carrier's phase is given importance is called as
(a) Coherent detection (b) Non coherent detection
(c) Both (a) and (b) (d) None of these
5. The properties used for pseudorandom sequence are
(a) Balance (b) Run (c) Correlation (d) All the above

PART - B (5 x 3 = 15 Marks)

6. Define channel capacity.
7. Calculate the Hamming distance for two code words 11100 and 11011?

8. Justify the statement 'ISI can-not be avoided'?
9. List the advantages of PSK systems.
10. Define Pseudo-Noise (PN) sequence.

PART - C (5 x 16 = 80 Marks)

11. (a) Explain in detail about the
 - (i) Discrete memory less channels. (8)
 - (ii) Source coding theorem. (8)

Or

 - (b) Describe the Shannon Fano coding and Huffman coding with examples. (16)
12. (a) Describe the Hamming codes with suitable example. (16)

Or

 - (b) Explain Viterbi algorithm assuming a suitable convolution coder and received bit stream. (16)
13. (a) (i) Draw the block diagram of a digital communication system. Explain each block. (8)
(ii) Discuss the advantages of digital communication over analog communication. (8)

Or

 - (b) Explain Nyquist first criterion for ISI elimination. (16)
14. (a) (i) Derive the expression for bit error probability of a matched filter. (10)
(ii) Explain the ML detection. (6)

Or

 - (b) Discuss about the coherent detection of QPSK and non-coherent detection of ASK. (16)
15. (a) Describe the synchronization and PN sequence. (16)

Or

 - (b) Explain the frequency hopping spread spectrum. (16)