Register Number……

M.E. DEGREE EXAMINATIONS: DECEMBER 2009

First Semester

COMMUNICATION SYSTEMS

COM502: Modern Digital Communication Techniques

Time: Three Hours **Maximum Marks: 100**

Answer All the Questions:-

PART A (10 x 2 = 20 Marks)

1. What is meant by memoryless channel?
2. Write down the mathematical expression of a low pass CPM signal
3. Express the input output relation of a waveform AWGN channel
4. What are band limited channels?
5. What is multi-h CPM?
6. Define the term suboptimum in detection
7. Give an example for an irreducible polynomial
8. Define Galois field
9. What is meant by punctured codes?
10. What are RCPC codes?

PART B (5 x 16 = 80 Marks)

11. (a) Draw the signal space diagram of a QPSK signal and derive the expression for calculating the d_{min}.

(OR)

(b) (i) What is meant by non-linear modulation? (4)

(ii) Generate the bi-orthogonal signal of size n=16 (12)

12. (a) Derive and implement the M-ary correlation receiver

(OR)

(b) Derive the expression for a union bound on probability of errors in orthogonal signaling.

13. (a) Derive the bit error probability of a non-coherent FSK modulated signals.

(OR)

(b) Draw and explain the DPSK receiver.

14. (a) (i) State Shanon's capacity theorem (4)

(ii) Derive the fundamental relation between bandwidth and power of a communication system (12)

(OR)

(b) Consider the (7, 4) linear block code. Derive the G and H matrix and construct the all possible code words.

15. (a) Explain the maximum likelihood decoding of convolutional codes.

(OR)

(b) List out and explain with an example the Ungerboeck partitioning rules.

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