



Name :

Reg. No:

SEVENTH SEMESTER B.TECH DEGREE EXAMINATION, OCTOBER 2012

EC/PTCE 09 701 - INFORMATION THEORY AND CODING
(2009 Admission)

Time : Three Hours

Maximum : 70 Marks

PART - A

- I (1) Write down the properties of self information.
 (2) State channel coding theorem.
 (3) What is a field? Give an example from communication scenario.
 (4) What is the need for channel coding?
 (5) Define hamming distance. State its significance in the design of error control codes.

(5 x 2 = 10 Marks)

PART - B

- II (1) State and prove maximal and additive properties of entropy.
 (2) Write brief notes on Lempel ziv coding.
 (3) Discuss the basic properties of Galois field.
 (4) Discuss the error detection and correction capabilities of linear block codes and cyclic codes.
 (5) Design a convolutional codes of constraint length 6 and rate efficiency $\frac{1}{2}$. Draw its state diagram.
 (6) Write on interleaved codes.

(4 x 5 = 20 Marks)

- III (a) State and prove source coding theorem.

(Or)

- (b) Encode the following source using Huffman and Shannon-Fano encoding procedures. Find the efficiency in each case.

$$x = \{x_1, x_2, x_3, x_4, x_5\}$$

$$p(x) = \{0.4, 0.15, 0.05, 0.25, 0.15\}$$

- IV (a) Explain coding and decoding procedures BCH codes.

(Or)

- (b) Explain coding and decoding of Read Solomon codes.

- V (a) Explain coding and decoding of systematic linear block codes.

(Or)

- (b) Explain coding and decoding of non-systematic cyclic codes.

- VI (a) Explain literbi algorithm with an example.

(Or)

- (b) Write notes on Turbo codes and Trellis codes.

(4 x 10 = 40 Marks)
