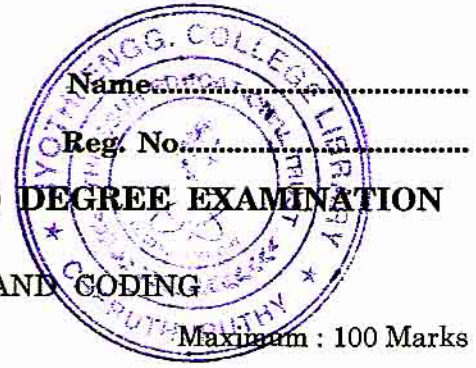


C 29179



**SEVENTH SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION
JUNE 2012**

EC 2K 703—INFORMATION THEORY AND CODING

Time : Three Hours

Maximum : 100 Marks

Answer all questions.

- I. (a) Explain the properties of entropy.
(b) Write notes on Binary Symmetric Channel.
(c) Write notes on parity check matrices of linear block codes.
(d) Explain the decoding of linear block codes.
(e) Explain the construction of Galois field.
(f) Explain the features of BCH codes.
(g) Draw the trellis diagram of a convolutional coder of constraint length 8 and rate efficiency $\frac{1}{2}$.
(h) Draw the state diagram and tree diagram of convolutional codes.
- (8 × 5 = 40 marks)
- II. (a) State and prove channel coding theorem.
- Or*
- (b) (i) Encode the following source using Shannon Fano procedure
 $p(x) = \{ 0.2, 0.15, 0.25, 0.4 \}$. Find the efficiency of the code.
(ii) Write notes on Lempel Ziv coding.
- III. (a) Explain the encoding of linear block codes. Explain the error detection and correction capabilities of linear block codes.
- Or*
- (b) Explain the generation and decoding of cyclic codes.
- IV. (a) (i) Explain the properties of Galois field.
(ii) Write note on groups, fields and binary field arithmetic.
- Or*
- (b) (i) Explain the encoding of Reed Solomon Codes.
(ii) Show that Reed Solomon code is the maximum distance separable code and its minimum distance is $n - k + 1$. Give any *five* applications of Reed Solomon codes.
- V. (a) Explain sequential decoding of convolutional codes.
- Or*
- (b) Explain maximum likelihood decoding of convolutional codes.

(4 × 15 = 60 marks)