AA-62

M. Tech. EXAMINATION, Dec. 2018

(First Semester)

(B. Scheme) (Re-appear Only)

ECE/Industry Integrated

MTEC503B

INFORMATION AND COMMUNICATION THEORY

Time : 3 *Hours*]   [*Maximum Marks :* 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

(3-41/*13*)M-AA-62   **P.T.O.**

Unit I

1. Consider a (7, 4) code whose generator matrix is given by G. Find the followings : All codewords of the Code, Parity check matrix of the code and error detecting/correcting capability of the code, and Syndrome for the received vector 1 1 0 1 1 0 1. Is this the valid code vectior ?   **15**

$$G = \begin{bmatrix} 1 & 1 & 1 & 1 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & 1 & 0 & 0 \\ 0 & 1 & 1 & 0 & 0 & 1 & 0 \\ 1 & 1 & 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

2. Find the genarator polynomial and design the coder for (31, 16) BCH code, $t \le 3$. Decode the received vector $W(X) = 1 + X + X^{11}$.**15**

Unit II

3. (a) How to the error detecting and error correcting capabilities are compared ?
   (b) What kind of coding has been applied to CDs ? Explain.   **10+5**

4. (a) What do you mean by source coding ? Why is it required ?
   (b) How is it different from channel coding ?
   (c) What are different types of source coding ?   **5+5+5**

Unit III

5. State and prove Shannon-Hartley capacity theorem for a channel.   **15**

6. Draw the trellis diagram of convolution code of code rate $r = 1/2$ and constraint length of K = 3 starting from the state table and state diagraem for most commonly used encoder.   **15**

Unit IV

7. (a) How the efficiency of estimator is calculated ?
   (b) Explain the Weiner filter and its role. **15**

8. (a) Explain Asymptotic properties.
   (b) Explain Bayes Criteria.   **15**