PVP 17

Code: **17ECMC2T5B**

I M.Tech - II Semester – Regular/Supplementary Examinations
July - 2019

CODING THEORY
(MICROWAVE & COMMUNICATION ENGINEERING)

Duration: 3 hours Max. Marks: 60

Answer the following questions.

1. a) Illustrate encoding and decoding circuits of a systemic (7,4) codes. 8 M

   b) Construct the decoding Table for a single error correcting (7, 4) Cyclic code, whose generator polynomial is $g(x)= 1+ x^2+x^3$. 7 M

OR

2. a) Draw the syndrome circuit for the (7,4) cyclic code generated by $g(x)= 1+ x+x^3$. What will be its syndrome if the received vector is (0 0 1 0 1 1 0). 8 M

   b) List out and prove any three theorems related to cyclic codes. 7 M

3. a) Illustrate t error correcting reed-solomon code with its generator polynomial. 6 M

b) Determine the generator polynomials of all primitive BCH codes of length 31. Use galios field GF (2^5) generated by $p(X) = 1+X^2+X^5$. 9 M

OR

4. a) Devise a syndrome computation circuit for a binary double error correcting (31,21) BCH Code. 10 M

b) Illustrate BCH code with its generator polynomial. 5 M

5. a) Draw and explain the operation of a (2,1,3) convolution encoder. 7 M

b) Consider (3,1,2) convolution code with G(1) =(1 1 0), G(2) = (1 0 1), G (3) = (1 1 1). Draw the encoder block diagram and find the generator matrix G. 8 M

OR

6. a) Consider (3,1,5) systematic code with G(2) =(1 0 1 1 0 1), G(3) = (1 1 0 0 1 1). Find generator matrix G and parity sequence corresponding to the information sequence u= (1 1 0 1). 8 M

b) Consider (3,2,3) systematic code with G(1) =1 + D^2 + D^3, G(2) =1 + D+ D^3. Draw the straight forward realization of encoder. 7 M

7. a) What are turbo codes? Briefly explain it with its turbo encoder (r= 1/3). 8 M

b) Discuss distance properties of turbo codes. 7 M

OR

8. a) Give the performance analysis of turbo codes. 7 M

b) What is an LDPC code? Give the equations for a simple LDPC code with n=12. 8 M