

Code: **ECMC1T6B**

I M.Tech - I Semester - Regular Examinations – March 2014

**CODING THEORY AND PRACTICE
(MICROWAVE & COMMUNICATION ENGINEERING)**

Duration: 3 hours

Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. Define the terms Channel Rate and Channel Capacity. How are they related? What do you understand by Shannon-Hartley theorem? Discuss Shannon limit, Bandwidth and signal to noise ratio trade offs? 14 M

2. a) Develop the encoder and syndrome calculator of a cyclic code for the generator polynomial $g(p)=1+D+D^3$. 7 M

b) For the same encoder and the message of "1 0 1 1 0 1 1" "assign convolution code through veterbi algorithm and specify the state diagram also. 7 M

3. a) What are the types of errors? Discuss the sources of errors in detail? And also explain how to reduce errors in communications? 7 M

b) Explain in detail about the structural properties of convolution codes? 7 M

4. a) What are linear block codes ? Give its types? Define code rate. How does redundancy in code effect the efficiency and error? 7 M
- b) Conform the possibility of a (18,7) binary code that can correct up to three errors. Can this code correct up to four errors? 7 M
5. a) Write the properties of the finite fields and Rings? 7 M
- b) Explain about minimal polynomials? 7 M
6. a) Write brief note on 7 M
- i) BCH code
 - ii) RS code
- b) Discuss Coherent and non-coherent detection techniques. 7 M
7. a) Construct a systematic (7, 4) cyclic code using the generator polynomial $g(x) = x^3 + x + 1$ 8 M
- i) What are the error correcting capabilities of this code?
 - ii) Construct the decoding table.
 - iii) If the received word is 1101100, determine the transmitted data word.
- b) Briefly comment on convolution codes. 6 M

8. a) Write in detail about the compact disc along with a neat diagram? 7 M
- b) Explain in detail about shift register implementation of a cyclic code? 7 M