Total No. of Questions : 8] *[Total No. of Printed Pages : 2*

Roll No .....

MEDC-301(A)

M.E./M.Tech., III Semester

Examination, November 2019

Information Theory and Coding

(Elective-I)

Time : Three Hours

Maximum Marks: 70

Note : i) Attempt any five questions.
ii) All questions carry equal marks.
iii) Assume suitable data, if required.

1. a) Prove the statement "If a receiver knows the message being transmitted, the amount of information carried will be zero."
   b) What do you mean by Entropy? Show that Entropy is maximum when all symbols are equiprobable.

2. a) Explain channel capacity theorem in detail.
   b) Write and explain Shannon's theorem in brief.

3. Write short notes on:
   a) Shannon Hartley Theorem
   b) Linear Block codes

4. a) What do you understand by convolution codes? How are these constructed?
   b) Write and explain Viterbi algorithm for maximum likelihood decoding.

5. Write short notes on:
   a) Huffman coding
   b) Lempel-Ziv coding

6. a) Explain different types of channels with their channel matrix and channel diagram.
   b) Find coding Efficiency using Huffman coding for the following message ensemble.

[X] =	X_1	X_2	X_3	X_4	X_5	X_6	X_7
[P] =	0.4	0.2	0.12	0.08	0.8	0.8	0.04

7. a) Describe mutual information. Explain its different properties with suitable examples.
   b) Discuss syndrome computation and error detection in detail.

8. Write short notes:
   a) Cyclic codes and their properties
   b) Hamming codes and their applications

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