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

Roll No .....

IT-8003 (3) (CBGS)

B.E. VIII Semester

Examination, May 2019

Choice Based Grading System (CBGS)

Information Theory and Coding

Time : Three Hours

Maximum Marks : 70

Note: i) Attempt any five question.

ii) All questions carry equal marks.

1. a) State and explain Shannon Hartley theorem. 7
   b) Construct the Huffman code with minimum code variance for the following probabilities and also determine the code variance and code efficiency: 7
   {0.25, 0.25. 0.125, 0.125, 0.125,0.0625, 0.0625}

2. a) Briefly describe the steps of Viterbi algorithm. 7
   b) Find the generator and parity check matrices of a(7,4) cyclic code with generator polynomial 7
   $g(X) = 1 + X + X^3$.

3. Explain the Linear Predictive Coding (LPC) model of analysis and synthesis of speech signal. State the advantages of coding speech signal at low bit rates. 14

4. a) Discuss the MPEG compression techniques. 7
   b) Discuss about the various Dolby audio coders. 7

5. a) Explain the "Motion estimation" and "Motion Compensation" Phases of P and B frame encoding process with diagrams wherever necessary. 7
   b) Explain arithmetic coding with suitable example. 7

6. a) Construct a Shannon - Fano code for X, and calculate the efficiency of the code. http://www.rgpvonline.com 7
   b) Compute the Huffman code for this source moving a combined symbols as high as possible. 7

7. a) From channel capacity theorem, find the capacity of a channel with infinite bandwidth and explain. 7
   b) What is source coding? Define code length and code efficiency. Give the relation between it. 7

8. a) Derive the relationship between entropy and mutual information. 7
   b) Explain the encoding procedure of I,P and B frames in video encoding with suitable diagrams. 7

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