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BIELE-010

B.Tech. – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING

(BTECVI)

00596 **Term-End Examination**

June, 2015

BIELE-010 : SIGNAL COMPRESSION

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any* ***seven*** *questions. All questions carry equal marks.*

1. (a) Explain the predictive coding scheme with the help of the following sequence : 5

27 28 29 28 26 27 29 28 30 32 34 36 38

(b) Explain the steps to derive average information with an example. 5

2. (a) Explain the minimum variance of Huffman coding procedure with an example. 5

(b) Describe the procedure for the adaptive Huffman coding algorithm, with the help of a suitable flow chart. 5

3. (a) Design a 3-bit Tunstall code for a memoryless source with the following alphabet :

$A = \{A,B,C\}$

$P(A) = 0{\cdot}6,\ P(B) = 0{\cdot}3,\ P(C) = 0{\cdot}1.$ *5*

(b) Explain the converse of the Rate distortion theorem. *5*

4. Describe the LZW algorithm for building adaptive dictionary. Using this approach, encode the following sequence :

wabbafwabbafwabbafwabbafwoofwoofwoofwoo

where f represents space. *10*

5. Encode the following sequence using Prediction with Partial Match (PPM) algorithm :

this # is # the # tithe

Assume the necessary count and cum-count arrays. Given that the word length is to be 6 and # represents space. *10*

6. Differentiate between uniform and non-uniform quantization with example. *10*

7. (a) Explain discrete convolution with appropriate flow diagram. 5

(b) What is Karhunen-Loeve Transform ? Explain in brief. 5

8. Explain the different analysis and synthesis schemes for Audio Signals. 10

9. Describe the following in brief : 2×5=10

(a) Burrows-Wheeler Transform

(b) Tree structured Vector Quantizers

10. Write short notes on the following : 2×5=10

(a) Discrete Cosine Transform

(b) Sub-band Coding Algorithm