B.Tech. – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

00786 **Term-End Examination**

December, 2014

BIELE-010 : SIGNAL COMPRESSION

Time : 3 hours *Maximum Marks : 70*

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

1. Define the following terms : $4 \times 2\frac{1}{2} = 10$

   (a) Compression Ratio

   (b) Rate of Distortion Function

   (c) Discrete Sine Transform

   (d) Fidelity

2. Values for the various probabilities of a binary image are given below :

$$P(S_w) = \frac{30}{31}, P(S_b) = \frac{1}{31}$$

$$P(w/w) = 0.99, P(b/w) = 0.01$$

$$P(b/b) = 0.7, P(w/b) = 0.3$$

Find out the entropy in bits for Markov model and Probability model with iid assumption. Finally compare both of them. *10*

3. Explain Golomb codes and design it for m = 5, where m is Golomb code parameter. *10*

4. Describe the LZ77 approach for building adaptive dictionary. Using this approach, encode the following sequence :

...cabracadabrarrarrad...

Suppose the length of the window is 13, the size of the look-ahead buffer is 06, and the current condition is

| cabraca | dabrar |

with "dabrar" in look-ahead buffer. *10*

5. Explain dynamic Markov compression by considering all the issues to be addressed. *10*

6. Explain the following types of quantizations : *5+5=10*

    (a)   Adaptive quantization

    (b)   Vector quantization

7. (a)   Explain video compression standards.   *5*

    (b)   Differentiate between time domain sampling and frequency domain sampling.   *5*

8. Explain ITU-T H.261 encoder with proper block diagram. Explain each block with example.   *10*

9. Explain the following : $4 \times 2\frac{1}{2} = 10$

    (a)   MPEG audio coding algorithm

    (b)   SPIHT algorithm

    (c)   MPEG-2 AAC coding

    (d)   LPC-10

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

    (a)   Extended Huffman coding

    (b)   Walsh Hadamard Transform