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Paper Id: 

110241
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Sub Code: NCS 085

Roll No. 

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**B TECH**  
**(SEM-VIII) THEORY EXAMINATION 2018-19**  
**DATA COMPRESSION**

Time: 3 Hours

Total Marks: 100

**Note:** Attempt all Sections equally & missidg the n hoosaitably.

**SECTION A**

1. Attempt the questions brief. **2 x 10 = 20**
- Is Huffman coding is a lossless or lossy compression? Write applications of Huffman coding.
  - What is a composite source model?
  - What are prefix codes?
  - Explain JBIG standard.
  - Explain entropy.
  - Define compression ratio.
  - Determine whether the code {0, 10, 110, 111} is uniquely decodable or not.
  - Which compression technique is used in “compress” command of Unix operating systems?
  - Explain uniform quantizer.
  - What is entropy coded quantization?

**SECTION B**

2. Attempt any *three* of the following: **10 x 3 = 30**
- What are the advantages of vector quantization over scalar quantization? Explain with the help of an example.
  - What is Data Compression? Why we need it? Explain Compression and Reconstruction with the help of block diagram.
  - Write short note on Golomb codes & Tunstall codes.
  - What do you mean by Quantization? Describe the quantization problem with the help of an example in detail.
  - Explain various types of dictionary based coding techniques.

**SECTION C**

3. Attempt any *one* part of the following: **10 x 1 = 10**
- What do you mean by lossless compression and lossy compression? Compare lossless compression with lossy compression
  - What do you understand by information? Give an alphabet  $A = \{a, a_2, a_3, a_4\}$ , find the first order entropy of the following:  $P(a_1) = 1/2, P(a_2) = 1/4, P(a_3) = P(a_4) = 1/8$ .
4. Attempt any *one* part of the following: **10 x 1 = 10**
- Given the eight symbols A, B, C, D, E, F, G, and H with probabilities 1/30, 1/30, 1/30, 2/30, 3/30, 5/30, 5/30, and 12/30:
    - Draw the Huffman tree for these symbols.
    - Compute the average no. of bits/symbol.
  - Differentiate between adaptive Huffman coding and Huffman coding?

5. **Attempt any *one* part of the following:** **10 x 1 = 10**  
(a) Compare and contrast LZ77 and LZ78 with examples  
(b) Discuss the steps involved in Basic Algorithm for Prediction with Partial Match. (PPM).
6. **Attempt any *one* part of the following:** **10 x 1 = 10**  
(a) Explain the various distortion criteria used in lossless schemes.  
(b) Differentiate between uniform and non uniform quantization.
7. **Attempt any *one* part of the following:** **10 x 1 = 10**  
(a) Differentiate between scalar quantization and vector quantization.  
(b) Explain the steps of Lindo-Buzo-Gray algorithm.

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