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Paper Id:

110241

Sub Code: NCS 085

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

Time: 3 Hours**Total Marks: 100****Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A**

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

SECTION B

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

SECTION C

- 3. Attempt any one part of the following: 10 x 1 = 10**
- (a) What do you mean by lossless compression and lossy compression? Compare lossless compression with lossy compression
 - (b) 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**
- (a) 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:
 - i) Draw the Huffman tree for these symbols.
 - ii) Compute the average no. of bits/symbol.
 - (b) 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.

Dr. Nitin Agarwal

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