

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

**CLASS: MTECH  
BRANCH: IS**

**SEMESTER : III  
SESSION : MO/19**

**SUBJECT: CS602 DATA COMPRESSION**

**TIME: 3 HOURS**

**FULL MARKS: 50**

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) Differentiate between Static Huffman Coding and Adaptive Huffman Coding with example. Explain update procedure for Adaptive Huffman Coding. [5]
- Q.1(b) Design a minimum variance Huffman code for a source that put out letter from an alphabet  $A=\{a_1, a_2, a_3, a_4, a_5, a_6\}$  with  $P(a_1) = P(a_2) = 0.2$ ,  $P(a_3) = 0.25$ ,  $P(a_4) = 0.05$ ,  $P(a_5) = 0.15$ ,  $P(a_6) = 0.15$ . Find the entropy of the source, average length of the code and the efficiency. [5]
- Q.2(a) What is Dictionary coding? Compare and contrast LZ77 and LZ78 with examples. [5]
- Q.2(b) Where we use the dictionary techniques of encoding? Explain various types of dictionary Techniques. [5]
- Q.3(a) What is Quantization? Explain the process of Quantization in JPEG. [5]
- Q.3(b) Explain step by step algorithm for image compression using RLE algorithm. [5]
- Q.4(a) What do you mean by codebook of a quantizer? What problems can be there when designing a Codebook for a higher dimensional quantizer? [5]
- Q.4(b) Explain Lindo Buzo Gray algorithm with its advantages. [5]
- Q.5(a) Explain the steps involved in video compression. Also explain the different layers of MPEG-1 Video syntax. [5]
- Q.5(b) Explain the encoder and decoder diagrams of H.261 [5]

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