

**GUJARAT TECHNOLOGICAL UNIVERSITY**MCA Sem-4<sup>th</sup> Regular Examination May 2011**Subject code: 640007****Subject Name: Data Compression****Date: 26/05/2011****Time : 02.30 p.m. – 05.00 p.m.****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1 (a)** Answer in short: **07**
1. What is Entropy?
  2. The main data structure in LZ77 is a \_\_\_\_\_
  3. What does Sampling consist of?
  4. \_\_\_\_\_ is an important consideration when choosing between two Huffman codes that have the same average length
  5. What is called Adaptive modeling?
  6. Symbols that are to be stored or manipulated by a computer are converted to \_\_\_\_\_
  7. What is Sibling Property?
- (b)** State True or False: **07**
1. The DAC is responsible for taking a digital value and converting it to a corresponding analog signal
  2. The signal we get after going through a compression/expansion cycle is identical to the original
  3. The DCT is similar to the Fast Fourier Transform.
  4. Lossy compression compresses a text stream so that it can be expanded into an identical copy of the stream
  5. The Inverse DCT is performed using the exact reverse of the operations performed in the DCT.
  6. A static dictionary will compress an entire stream using the same dictionary.
  7. Images compressed with the JPEG algorithm undergo a “lossy” compression.
- Q.2 (a)** Differentiate the following : **07**
1. Lossy Data Compression and Lossless Data Compression
  2. Static and Adaptive Dictionary Coding Scheme
- (b)** What are the various applications of Huffman coding **07**
- OR**
- (b)** Explain the characteristics of dictionary based compression with Example. **07**
- Q.3 (a)** Explain Shannon-Fano Algorithm **07**
- (b)** Explain Sampling Variables in Detail. **07**
- OR**
- Q.3 (a)** Explain the main steps for JPEG compression **07**
- (b)** Write down the code for silence compression **07**
- Q.4 (a)** What is Quantization? How it works? **07**
- (b)** Explain by an example how the size of window affects the performance of LZ77 algorithm. **07**

**OR**

- Q.4** (a) Explain all the parameters required for a silence compression program **07**  
(b) Explain Decoding process in detail **07**
- Q.5** (a) Explain the concept of Quantization in Lossy Compression with the help of an example **07**  
(b) What is the significance of Discrete Cosine Transform (DCT) in JPEG baseline Algorithm? **07**

**OR**

- Q.5** (a) What are the advantages of arithmetic coding? Write its applications **07**  
(b) What are the problems with LZ78 dictionary based algorithms? **07**

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