

GUJARAT TECHNOLOGICAL UNIVERSITY**MCA - SEMESTER-IV • EXAMINATION – SUMMER • 2014****Subject Code: 2640007****Date: 03-06-2014****Subject Name: Data Compression (DC2)****Time: 10:30 am - 01:00 pm****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) Select the most appropriate answer**07**

1. The basic idea behind Huffman coding is to
 - a. expand data by using fewer bits to encode more frequently occurring characters
 - b. compress data by using fewer bits to encode more frequently occurring characters
 - c. compress data by using more bits to encode more frequently occurring characters
 - d. compress data by using fewer bits to encode fewer frequently occurring characters
2. Without losing quality, JPEG-2000 can achieve compression ratios of
 - a. 2:1
 - b. 20:1
 - c. 200:1
 - d. 2000:1
3. The best visual compression quality is achieved using
 - a. Fourier transform
 - b. Wavelets
 - c. Dolby
 - d. DCT
4. Down sampling is to make a digital image file smaller by
 - a. adding pixels
 - b. removing noise
 - c. removing pixels
 - d. adding noise
5. In a typical picture, most pixels will be
 - a. very different to their neighbors
 - b. equal
 - c. very similar to their neighbors
 - d. bright
6. Huffman coding is an encoding algorithm used for
 - a. broadband systems
 - b. lossless data compression
 - c. lossy data compression
 - d. files greater than 1 Mbit
7. The idea with wavelets is to represent a complicated function by
 - a. square functions
 - b. simple basic functions
 - c. sinus functions
 - d. lines

- (b) **Write Full form** **07**
- 1) ADPCM
 - 2) CCITT
 - 3) MPEG
 - 4) PKZIP originally written by _____
 - 5) RLE
- Define**
- 6) Phrase
 - 7) Entropy
- Q.2 (a)** A discrete source emits one of five symbols every millisecond. **07**
A source $A = \{ v, w, x, y, z \}$ has probabilities $\{ 1/2, 1/4, 1/8, 1/16, 1/16 \}$ respectively.
Generate source entropy and information rate.
- (b) 1. Lossy Vs. Lossless Compression **07**
2. Audio Compression vs. Video Compression
- OR**
- (b) 1. Statistical Modeling vs. Dictionary Based Modeling **07**
2. Coding Vs. Modeling
- Q.3 (a)** Explain LZ77 with suitable example. **07**
(b) Draw Shannon-Fano tree based on this Symbols (A, B, C, D, E) with Frequency (15, 7, 6, 6, 5) using division table. **07**
- OR**
- Q.3 (a)** Explain LZ78 with suitable example. **07**
(b) Write down Simple Huffman Algorithm and Draw Huffman tree based on this Symbols (A, B, C, D, E) with Frequency(15,7,6,6,5). **07**
- Q.4 (a)** What is Dictionary Based Compression explain with Example. **07**
(b) What is Balancing Act and how it is useful in Sliding Window Compression. **07**
- OR**
- Q.4 (a)** Explain static and adaptive methods of Dictionary Based Compression. **07**
(b) What is Sliding Windows Compression how it is useful compared to Dictionary Based Compression. **07**
- Q.5 (a)** Explain the concept of Quantization in Lossy Compression **07**
(b) Discuss about PC-based sound. **07**
- OR**
- Q.5 (a)** Write a short note on Discrete Cosine Transform (DCT) **07**
(b) Explain two important factors affecting the quality of reproduction of audio waveform. **07**
