

# Data Compression

## UNIT : 1

### (Short Questions)

1. Define Data Compression.
2. Define Compression Ratio.
3. What do you understand by lossless Data Compression?
4. What do you understand by lossy Data Compression?
5. Write a short note on Fidelity and quality.
6. Explain Composite Model briefly.
7. Write about Physical Model.
8. Define Probability Model.
9. What do you understand by Distortion.
10. Define Coding.

### (Long Questions)

1. Define Data Compression and its types.
2. Explain lossless and lossy data compression with example and differentiate them.
3. What do you understand by prefix code, explain it with example.
4. Write down different measures of performance.
5. Explain the various Distortion Criteria used in lossless schemes.
6. What is Data Compression and why we need it and give its advantages.
7. Explain modeling and coding with the help of example.
8. What do you understand by prefix code?
9. Explain Compression and Reconstruction with the help

block diagram.

## UNIT: 2 (Short Questions)

1. Is Huffman coding is a lossless or lossy compression?
2. Write the application of Huffman coding.
3. Determine whether the code  $\{0, 10, 110, 111\}$  is uniquely decodable or not.
4. What do you understand by Text Compression?
5. Describe Golomb Code.
6. Write short note on Tunstall code.
7. Explain Image Compression.

## Long Questions

1. What is minimum code variance Huffman Coding.
2. Explain Golomb code with example.
3. Draw the flowchart of decoding in adaptive Huffman Coding.
4. Given eight symbols A, B, C, D, E, F, G, 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.
5. Explain the Adaptive Huffman Coding with an example of encoding.
6. Write the algorithm of Tunstall Code, with the example.
7. Write down the algorithm for Rice Codes.
8. Write down different applications of Huffman Coding.

9. Differentiate Huffman Coding with Minimum Variance Huffman Coding.
10. What do you understand by Audio Compression?

### UNIT:3 (Short Questions)

1. Discuss the binary code.
2. Explain Entropy.
3. Explain JBIG standard.
4. Explain JBIG 2 standard.
5. Define CALIC.
6. How we use compression over V.42 bits?
7. List out different image compression.
8. Brief note on Diagram Coding.
9. Explain JPEG-LS.
10. Define Multiresolution.

### Long Questions

1. What is Arithmetic Coding? Write Down the algorithm for this.
2. Encode the sequence "1321" /  $a_1 a_3 a_2 a_1$ ,  $f_x(k) = 0$ ,  $k \leq 0$ ,  $f_x(1) = 0.8$ ,  $f_x(2) = 0.82$ ,  $f_x(3) = 1$ ,  $f_x(k) = 1$ ,  $k > 3$ .
3. Write an algorithm for generating Binary code.
4. Generate a Binary code for  $A = \{a_1, a_2, a_3, a_4\}$  with probabilities:  
 $P(a_1) = 0.5$ ,  $P(a_2) = 0.25$ ,  $P(a_3) = 0.125$ ,  $P(a_4) = 0.125$

5. Find the difference between JBIG and JBIG2 standards.
6. Write Diagram Coding algorithm with an example.
7. Explain the LZ77 approach.
8. Explain the LZ78 approach in Adaptive Dictionary.
9. Write different applications of Dictionary Techniques.
10. Explain the Burrows-Wheeler Transform with the suitable example.

### UNIT: 4 (Short Questions)

- ① Explain Uniform quantizer.
- ② What is entropy coded quantization?
- ③ Define Auditory Perception.
- ④ What is Fletcher Munson Curves.
- ⑤ Define Physical Models.
- ⑥ Explain Gamma Distribution.
- ⑦ Define Uniform Distribution.
- ⑧ Write down Gaussian Distribution with its equation.
- ⑨ Explain Laplacian Distribution.
- ⑩ Write down the Advantages of Uniform quantizer.

### Long Questions

- ① What do you mean by Quantization? Describe the quantization problem with the help of example.
- ② Explain various types of dictionary based coding techniques.
- ③ Explain the various distortion criteria used in

lossless schemes.

4. Compare and contrast LZ77 and LZ78 with examples.
5. Differentiate between uniform and non-uniform quantization.
6. What is Facsimile Encoding? Explain Run-length coding technique.
7. What do you understand by uniform Quantization?
8. How uniform quantization of a uniformly distributed sources is done.
9. Explain forward Adaptive Quantization.
10. What is nonuniform quantization and give its types.

## UNIT: 5

1. Write advantages of Vector quantization.
2. Explain the steps of Linde Buzo-Gray Algorithm.
3. Discuss the steps involved in Basic Algorithm for prediction with Partial Match.
4. Differentiate between Scalar Quantization and Vector quantization.
5. Explain encoding and decoding in LZW algorithm.
6. Explain the Tree Structured Vector Quantizers.
7. Discuss Structured Vector Quantizers.
8. Explain the Design of Tree-Structured Vector Quantizers.
9. Explain the Pruned Tree-Structured Vector Quantizers.
10. Design a Decision tree for Quantizers.