



**GUJARAT TECHNOLOGICAL UNIVERSITY**

**BE - SEMESTER-VIII (old) - EXAMINATION – SUMMER 2018**

**Subject Code:181602**

**Date:30/04/2018**

**Subject Name:Data Compression**

**Time:10:30 AM to 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) What is data compression? Differentiate between lossy and lossless compression technique? Explain data compression and reconstruction with suitable diagram. **07**
- (b) Explain data compression = Modeling + coding **07**

- Q.2** (a) Define self information, Entropy and Average length of code. State the equations to calculate self information, Entropy and Average length of code. What is their significance? **07**
- (b) Explain statistical and dictionary based modeling techniques **07**

**OR**

- (b) Explain Shannon-Fano compression technique with following information. Calculate how many bits are required for below listed symbol and compare it with ASCII code **07**

symbol	D	C	B	F	A	E
count	10	20	21	3	39	7

- Q.3** (a) What do you mean by uniquely decodable code? Determine whether following codes are uniquely decodable or not. **07**
- (i) {0,01,11,111}
- (ii) {0,01,110,111}
- (iii) {1,10,110,111}
- (b) Explain minimum variance Huffman code? Explain its application over simple Huffman code. **07**

**OR**

- Q.3** (a) Design a Huffman code for source with alphabet set {a1,a2,a3,a4,a5} with  $p(a1)=P(a3)=0.2$ ,  $P(a2)=0.4$   $P(a4)=P(a5)=0.1$  Also find entropy, average length, and redundancy for this source. **07**
- (b) Explain how size of window affects the performance of LZ77 algorithm. **07**

- Q.4** (a) Explain adaptive Huffman encoding and update procedure? **07**
- (b) Explain LZ77 algorithm and state its drawbacks. **07**

**OR**

- Q.4** (a) Explain arithmetic coding encryption and decryption algorithm. List advantage of this compression technique? **07**
- (b) Why LZ77 and LZSS are called greedy algorithm? **07**

- Q.5** (a) Write a Short note on silence compression **07**
- (b) Explain JPEG image compression technique. What is the significance of DCT and Quantization in JPEG compression? **07**

**OR**

- Q.5** (a) Write a Short note on sampling and Quantization **07**
- (b) Explain the parameters used to evaluate the performance of compression algorithm **07**

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