Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (OLD) - EXAMINATION – SUMMER 2017

Subject Code:181602 **Date:29/04/2017**

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)**	Explain modelling, coding and entropy with the help of suitable examples.	**07**
	(b)	Why data compression is needed? Differentiate between Lossy and Lossless compression.	**07**
Q.2	**(a)**	Given an alphabet A = {a1, a2, a3, a4}, find the first order entropy in the following cases: 1. P(a1) = P(a2) = P(a3) = P(a4) =¼ 2. P(a1) = ½, P(a2) = ¼, P(a3) = P(a4) =1/8 3. P(a1) = 0.505, P(a2) = ¼, P(a3) = 1/8 and P(a4) =0.12	**07**
	(b)	Explain the Huffman code with proper example.	**07**
		OR	
	(b)	Explain Shannon-Fano algorithm in detail taking suitable example.	**07**
Q.3	**(a)**	Explain arithmetic coding with example and compare it with Huffman coding.	**07**
	(b)	Draw the necessary tree for the sequence “aardv” using the update procedure of Adaptive Huffman Coding.	**07**
		OR	
Q.3	**(a)**	What are the various applications of Huffman Coding? Also explain non binary Huffman code	**07**
	(b)	Give difference between static and adaptive dictionary coding scheme in details.	**07**
Q.4	**(a)**	Explain sliding window method with the help of an example.	**07**
	(b)	Write a short notes: a) PNG b) Sibling Property	**07**
		OR	
Q.4	**(a)**	What is LZW compression? Explain with the help of an example	**07**
	(b)	Describe the audio compression with proper diagrams.	**07**
Q.5	**(a)**	Explain the process of vector quantization.	**07**
	(b)	With the help of example explain how we can implement DCT in JPEG compression.	**07**
		OR	
Q.5	**(a)**	What is text compression? Explain the effect of dictionary size and size of the text file being encoded on amount of compression.	**07**
	(b)	Explain Run Length encoding with the help of a suitable example.	**07**

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