Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VI (NEW) EXAMINATION – WINTER 2020

Subject Code:2161603 **Date:27/01/2021**

Subject Name:Data Compression and data Retrival

Time:02:00 PM TO 04:00 PM **Total Marks: 56**

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	Justify statement with suitable arguments. (T/F) "DATA COMPRESSION =MODELING+ CODING "	**3**
	(b)	Define Following Terms 1. Compression Rate 2. 1st Order Entropy 3. Self-Information 4. Fidelity	**4**
	(c)	For compressing large volume of data, there exist 3 different algorithms A1, A2, A3. How to select best algorithm from given options.	**7**
Q.2	**(a)**	Define following terms: 1. Prefix Code 2. Instantaneous Code 3. Uniquely Decodable Code	**3**
	(b)	Differentiate following: 1. Minimum Variance Huffman vs Traditional Huffman Algorithm 2. Static Algorithms vs Dynamic Algorithms	**4**
	(c)	Find Extended Huffman Code for alphabet A={a_1,a_2,a_3} using probabilities {0.8, 0.02,0.18} respectively. Comment on values of Average length.	**7**
Q.3	**(a)**	Write the procedure to decode Arithmetic Coding Tag.	**3**
	(b)	Compare and Contrast Arithmetic Coding with Extended Huffman Coding.	**4**
	(c)	Write the method to generate a tag in Arithmetic Coding for string "statue".	**7**
Q.4	**(a)**	Differentiate Static Dictionary and Dynamic Dictionary based Algorithms	**3**
	(b)	Differentiate following: 1. LZ78 Encoding vs LZW encoding 2. Arithmetic Coding vs Dictionary Based Coding	**4**
	(c)	Encode string "ABABABABABAB" using LZW Coding.	**7**
Q.5	**(a)**	Which type of redundancies exists in Digital Images? Enlist all with suitable example.	**3**
	(b)	Explain significance of Quantization in JPEG Compression.	**4**
	(c)	Draw and Explain Block diagram for Baseline JPEG Algorithm for RGB image .	**7**

Q.6	**(a)**	Explain Prediction with Partial Match Process.	**3**
	(b)	Explain Burrows-Wheeler transform with example.	**4**
	(c)	Explain CALIC.	**7**
Q.7	**(a)**	Differentiate Uniform Quantization with Non-Uniform Quantization with their applications.	**3**
	(b)	Explain Pyramid vector quantization.	**4**
	(c)	Explain Lemmatization and Stemming in detail.	**7**
Q.8	**(a)**	How to measure effectiveness of an IR system?	**3**
	(b)	Explain challenges in XML information retrieval.	**4**
	(c)	Compare and Contrast: Best match and Exact match methods for information retrieval.	**7**