Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2023

Subject Code:3171615 Date:01-12-2023

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Distinguish Lossy and Lossless compression.	**03**
	(b)	Explain Markov Models in brief.	**04**
	(c)	Explain Huffman Coding in detail with example. Define Minimum variance Huffman codes.	**07**
Q.2	**(a)**	List out applications of Huffman Coding.	**03**
	(b)	Compare Huffman and Arithmetic coding.	**04**
	(c)	Define Arithmetic Coding. Encode and Decode "BACBA" with arithmetic coding. (P(A) = 0.5, P(B) = 0.3, P(C) = 0.2)	**07**
		OR	
	(c)	Define GOLOMB Code. Find Golomb code for n=8, 9…,13 and m=9.	**07**
Q.3	**(a)**	List out various application of dictionary coding.	**03**
	(b)	Explain Diagram coding with example.	**04**
	(c)	Discuss LZ77 algorithm and justify – the size of window affects the performance of LZ77 algorithm. List out advantage and disadvantage of LZ77.	**07**
		OR	
Q.3	**(a)**	List out application of Image Compression.	**03**
	(b)	Define 'Dictionary'. Differentiate static and dynamic dictionary.	**04**
	(c)	Explain encoding and decoding technique use in LZ78. Use LZW to encode the following string *wabbaBwabbaBwabbaBwabbaBwooBwooBwoo*	**07**
Q.4	**(a)**	Write short note on Old JPEG standard.	**03**
	(b)	Explain working of JPEG-LS compression technique.	**04**
	(c)	Explain Burrows-Wheeler Transform with example.	**07**
		OR	
Q.4	**(a)**	Explain Prediction with Partial Match (PPM) algorithm with escape symbol.	**03**
	(b)	Explain Move-To-Front Coding(MTF).	**04**
	(c)	Describe CALIC with example.	**07**
Q.5	**(a)**	Describe need of Quantization. List out types of quantization.	**03**
	(b)	Explain Forward Adaptive and Backward Adaptive.	**04**
	(c)	Explain Vector Quantization. Write down the procedure of Vector Quantization.	**07**
		OR	
Q.5	**(a)**	Differentiate Uniform Quantization with Non-Uniform Quantization.	**03**
	(b)	Discuss advantages of Vector Quantization over Scalar Quantization.	**04**
	(c)	Explain Linde-Buzo-Gray Algorithm in detail.	**07**