

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:2161603

Date:07-12-2023

Subject Name: Data Compression and data Retrieval

Time:02:30 PM TO 05:00 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.

- Q.1** (a) Explain probability model for data compression. 03
(b) Differentiate between lossy and lossless data compression. 04
(c) Define: i) entropy ii) self information iii) compression ratio iv) fidelity v) encoding vi) instantaneous code vii) distortion 07
- Q.2** (a) Discuss measures of performance for data compression algorithm. 03
(b) Explain Uniquely Decodable Code with example. 04
(c) Explain Huffman Coding with suitable example. 07
- OR**
- (c) Discuss update procedure of adaptive Huffman coding with suitable example. 07
- Q.3** (a) Explain prefix code with example. 03
(b) Explain how modelling and coding will help in data compression using following data. 04
9,11,11,11,14,13,15,17,16,17,20,21
(c) Explain Tunstall codes with suitable example. 07
- OR**
- Q.3** (a) Differentiate between static and dynamic dictionary. 03
(b) Explain Golomb code generation with $m=5$ and $n=0$ to 7. 04
(c) Derive the minimum variance Huffman code with given probabilities. 07
 $P(a) = 0.2, P(b) = 0.4, P(c) = 0.2, P(d) = 0.1$ and $P(e) = 0.1$
- Q.4** (a) Explain Diagram coding with example. 03
(b) Compare Uniform Quantization with Non Uniform Quantization. 04
(c) Explain arithmetic encoding method with example. 07
- OR**
- Q.4** (a) Explain how vector quantization is better than scalar quantization. 03
(b) Explain adaptive quantization with any one approach. 04
(c) Explain LZ77 with suitable example. 07
- Q.5** (a) Explain tokenization in brief. 03
(b) Explain challenges in XML information retrieval. 04
(c) Explain Lemmatization and Stemming in detail. 07
- OR**
- Q.5** (a) Write a short note on Skip Pointer. 03
(b) Explain CALIC method in brief. 04
(c) Write a short note on Old JPEG Standard and JPEG-LS 07
