

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024****Subject Code:2161603****Date:20-05-2024****Subject Name:Data Compression and data Retrival****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

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|------------|---|-----------|
| Q.1 | (a) Define the following | 03 |
| | 1. Compression Ratio | |
| | 2. Uniquely decodable code | |
| | 3. Entropy | |
| | (b) What is Data Compression? Apply the usage of modelling and coding in data compression. | 04 |
| | (c) For symbol A, B, C, D, E, F, G and H respectively with probability 0.3, 0.12, 0.16, 0.04, 0.10, 0.14, 0.08, 0.06. Find out Huffman code, Source Entropy, Average Length, Code efficiency and Redundancy. | 07 |
| Q.2 | (a) What is lossy compression? Give any two usages. | 03 |
| | (b) Differentiate | 04 |
| | 1. Static and Dynamic algorithms | |
| | 2. Statistical and Dictionary compression | |
| | (c) With the help of an example show the usage of adaptive Huffman coding. | 07 |
| | OR | |
| | (c) What is Extended Huffman coding? How it is used in increasing the coding efficiency? | 07 |
| Q.3 | (a) Give a suitable example where Shannon Fano method of compression is used over Huffman coding. | 03 |
| | (b) What are Prefix codes? Explain with the help of an example. | 04 |
| | (c) Explain Rice Code with the help of an example | 07 |
| | OR | |
| Q.3 | (a) What is sibling property? Where it is used? | 03 |
| | (b) Explain Tunstall code with an example. | 04 |
| | (c) Write a method to generate tag with the help of arithmetic coding. Take the string of your choice | 07 |
| Q.4 | (a) Differentiate LZ77, LZ78 and LZW. | 03 |
| | (b) What is Redundancy Code? Show the method to calculate it. | 04 |
| | (c) Explain Sliding Window compression technique with example. | 07 |
| | OR | |
| Q.4 | (a) How can we measure effectiveness in IR. | 03 |
| | (b) Compare Text-centric vs. data-centric XML retrieval methods | 04 |
| | (c) Explain process of Tokenization, Stemming and Lemmatization with suitable Example | 07 |
| Q.5 | (a) Explain Normalization | 03 |

- (b) Compare and Contrast uniform quantization and non-uniform quantization **04**
- (c) Encode the text of your choice with Burrows wheeler transform and Move to Front coding methods. **07**

OR

- Q.5** (a) Define **03**
1. Information Retrieval
 2. Inverted Index
 3. Self Information
- (b) Explain Prediction and partial match process **04**
- (c) Explain Tree Structured Vector Quantizers **07**
