PAPER ID-410565

Subject Code: KCS064

Roll No: | | | | | | | | | | | | | |

BTECH
(SEM VI) THEORY EXAMINATION 2023-24
DATA COMPRESSION

TIME: 3 HRS **M.MARKS: 100**

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2*10 = 20**

Qno	Questions	Marks	CO
(a)	What is Data Compression? Why it is needed?	02	1
(b)	Define compression ratio.	02	1
(c)	Explain the Huffman Algorithm	02	2
(d)	Discuss audio Compression.	02	2
(e)	Explain CALIC.	02	3
(f)	Define the term PPM.	02	3
(g)	Define distortion.	02	4
(h)	What do you understand by Quantization? Describe its types.	02	4
(i)	Write advantages of Tree structured vector quantization.	02	5
(j)	Explain scalar quantization	02	5

SECTION B

2. Attempt any *three* of the following: **10*3 = 30**

(a)	What do you mean by Uniquely Decodable code? Determine whether the following codes are uniquely decodable or not: (i) {0,01,11,111} (ii) {0,01,110,111} (iii) {1,10,110,111} (iv) {0,01,10}	10	1
(b)	Explain rice coding and it's implementation.	10	2
(c)	A sequence is encoded using LZW algorithm and the initial dictionary shown in the table. Index Entry 1 a 2 b 3 r 4 t The output of LZW encoder is the following sequence: 3 I 4 6 8 4 2 I 2 5 10 6 11 13 6 Decode this sequence.	10	3
(d)	What do you understand by adaptive quantization? Explain the various approaches to adapting the quantizer parameters.	10	4
(e)	Explain the steps of the Linde-Buzo-Gray algorithm.	10	5

SECTION C

3. Attempt any *one* part of the following: **10*1 = 10**

(a)	Explain modeling and coding with the help of examples. What do you understand by prefix code explain by an example?	10	1
(b)	Discuss various Data Compression models in detail.	10	1

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4. Attempt any *one* part of the following: 10 *1 = 10

(a)	Draw the Huffman tree for the following symbols whose frequency occurrence in a message text is started along with their symbol below: A:15, B:6, C:7, D:12, E:25, F:4, G:6, H:10, I: 15 . Find the Huffman code and average code length.	10	2
(b)	Design Golomb code for m=5 and n=6,7,8,9,10.	10	2

5. Attempt any *one* part of the following: 10*1 = 10

(a)	Discuss BWT with the help of an example.	10	3
(b)	Compare and explain LZ77, LZ78 and LZW schemes.	10	3

6. Attempt any *one* part of the following: 10*1 = 10

(a)	Describe the steps involved in Basic Algorithm for Prediction with Partial Match (PPM).	10	4
(b)	What do you understand by Uniform quantizer? How uniform quantization of a uniformly distributed sources and uniform quantization of non-uniform sources is done?	10	4

7. Attempt any *one* part of the following: 10*1 = 10

(a)	Describe the advantages of vector quantization over scalar Quantization	10	5
(b)	Explain Structure vector quantization and Pyramid vector quantization.	10	5