

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.

1.	Attempt all questions in brief.	2*	10 = 20	1
Qno	Questions	Marks	CO	
(a)	What is Data Compression? Why it is needed?	02	1	
(b)	Define compression ratio.	02	1	ĺ
(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	1
(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	-0.
(j)	Explain scalar quantization	02	5	S
	SECTION B		N	2
2.	Attempt any <i>three</i> of the following:	10*	*3 = 30	•
(a)	What do you mean by Uniquely Decodable code? Determine whether	10	Ū.	
	the following codes are uniquely decodable or not: (i) {0,01,11,111})	
1	(ii) {0.01.110.111} (iii) {1.10.110.111} (iv) {0.01.10}			i

SECTION

7 Attempt any three of the following.	. /

		10	
(a)	What do you mean by Uniquely Decodable code? Determine whether	10	
	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}	$\langle \cdot \rangle$	
(b)	Explain rice coding and it's implementation.	10	2
(c)	A sequence is encoded using LZW algorithm and the initial dictionary	10	3
	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.		
(d)	What do you understand by adaptive quantization? Explain the various	10	4
	approaches to adapting the quantizer parameters.		
(e)	Explain the steps of the Linde-Buzo-Gray algorithm.	10	5

SECTION C

3.	Attempt any one part of the following:	1	0*1 = 10
(a)	Explain modeling and coding with the help of examples. What do you	10	1
	understand by prefix code explain by an example?		
(b)	Discuss various Data Compression models in detail.	10	1

SECTION A

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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	10	2
	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.		
(b)	Design Golomb code for m=5 and n=6,7,8,9,10.	10	2

5.	Attempt any <i>one</i> part of the following:		10;	*1 = 10
(a)	Discuss BWT with the help of an example.	10		3
(h)	Compare and explain LZ77 LZ78 and LZW schemes	10		3

Attempt any one part of the following: 6.

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

7.	Attempt any <i>one</i> 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

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M.MARKS: 100

$10^{\circ}1 = 10$

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