Printed Pages:02 **Sub Code:NCS-085**

Paper Id: | 1 | 1 | 0 | 8 | 2 | 6 | **Roll No.** | | | | | | | | | | |

B.TECH
(SEM VIII) THEORY EXAMINATION 2017-18
DATA COMPRESSION

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION-A

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

(a) Define data compression and why we need it.
(b) Differentiate between compression and reconstruction.
(c) What are the limitations of Huffman coding.
(d) Write down the application of Huffman Coding in Text compression and audio compression.
(e) What do you mean by Binary Code? Compare Binary Code with Huffman Code.
(f) Define Graphic Interchange Format.
(g) What is rate distortion criterion?
(h) Differentiate between Uniform and non-uniform quantization.
(i) What is predictive coding?
(j) Write down the merits and demerits of vector quantization.

SECTION –B

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

(a) What do you understand by information? Give an alphabet A={a,a2,a3,a4,a5},find the first order entropy of the following:
P(a1)=1/2, P(a2)=1/4, P(a3)=P(a4)=1/8 , P(a5)=1/2 .

(b) For an alphabet A={a1,a2,a3,a4,a5} with probabilities P(a1) =0.15, P(a2) =0.04, P(a3)= 0.26,P(a4)=0.05 and P(a5)=0.50
(i) Calculate the entropy of this source (ii) Find a Huffman Code for this source.
(iii) Find the average length of the code

(c) What is the basic difference between Adaptive and Statistical Compression scheme? Discuss with the model of Adaptive Compression.

(d) Discuss the steps involved in Basic Algorithm for Prediction with Partial Match (PPM).

(e) What is Vector Quantization? Explain procedure for vector Quantization.

SECTION-C

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

(a) Explain physical, probability, Markov and composite source model in detail.

(b) 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}

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

(a) Design 3-bit Tunstall code for a memory less source with the following alphabet:
S= {A,B,C} with their P(A)=0.6, P(B)= 0.3 , P(C)= 0.1

(b) Design Golomb code for m=5 and n= 0,1,2,3,4,5,6,7,8,9,10.

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

(a) What is Facsimile Encoding? Explain Run-Length Coding technique used earlier for Facsimile. Give a brief comparison of MH, M& MMR and JBIG.

(b) Explain the JBIG standard of Bi level image compression.

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

(a) What do you understand by Adaptive Quantization? Explain the various approaches to adapting the quantizer parameters.

(b) What is lossy data encoding ? Write down the distortion measure criteria's to check the fidelity of a reconstructed source sequence to the original one in such type of encoding techniques.

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

(a) Explain the steps of the Linde-Buzo-Gray algorithm.

(b) What is Quantization? Explain Additive Noise Model of a quantizer.

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