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06CS663
IS

Sixth Semester B.E. Degree Examination, December 2010
Data Compression

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions, selecting at least TWO questions from each part.***

PART – A

1 a. Justify the need for compression. What are the different measurements to measure compression algorithms? **(06 Marks)**

b. Write the Huffman algorithm used for developing variable length codes. Generate the codes for the text : "attached detached" **(08 Marks)**

c. How is the Kraft-McMillan inequality used to test prefix codes? Explain. **(06 Marks)**

2 a. What are the advantages of static dictionary techniques? Give one static dictionary technique to compress the text data. **(06 Marks)**

b. Write the algorithm for the LZW code generation technique. Develop the LZW codes for the text "attached detached" assuming initial dictionary up to 255. **(08 Marks)**

c. Compare CALIC and JPEG-LS algorithms. Explain the JPEG-LS algorithm. **(06 Marks)**

3 a. Prove that, in an uniform quantiser of uniformly distributed source, the signal to noise ratio increases by 6 dB, for every bit being included in the quantizer. **(10 Marks)**

b. What is adaptive quantization? Explain two types of adaptive quantization. **(10 Marks)**

4 a. Write the CBG algorithm. How is it used for quantization? For the below training set and initial output set, find the final state of vector quantizer.

Training set :

Height	72	65	59	64	65	57	72	44	62	60	56	70
Weight	180	120	119	150	162	88	175	41	114	110	91	172

Initial set output :

Height	45	75	45	80
Weight	50	117	117	180

(12 Marks)

b. Illustrate with a graph, how the constant factor adaptive delta modulation works. **(08 Marks)**

PART – B

5 a. How is the discrete Fourier transformation obtained in sampling of data? Explain. **(08 Marks)**

b. For an 8 × 8 block of data in JPEG, how do transformation (DCT), quantization and coding take place? Is there any advantage of the zigzag scanning pattern, rather than conventional scanning of data in the 8 × 8 block? **(12 Marks)**

6 a. Write the block diagram of basic sub band coding system. Explain the analysis, quantization, coding and synthesis processes. **(10 Marks)**

b. With a block diagram, explain the MPEG audio coding. Compare layer 1, layer 2 and layer 3 strategies followed in MPEG audio coding. **(10 Marks)**

7 a. Explain the embedded zero tree coder used in wavelet compression. Demonstrate for the following data : **(10 Marks)**

26	6	13	10
-7	7	6	4
4	-4	4	-3
2	-2	-2	0

b. Explain set partitioning in hierarchical tree (SPIHT) algorithm and demonstrate the algorithm for the data used in Q.7.a. **(10 Marks)**

8 a. How are I, P and B frames in video classified? With an example, explain how the sequence of processing is different from the sequence of display. **(08 Marks)**

b. With a neat diagram, explain H 261 encoder used for video compression. **(07 Marks)**

c. What are the facilities added in MPEG – 2 compared to MPEG-1 standard, for video representation? **(05 Marks)**

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