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Sixth Semester B.E. Degree Examination, June/July 2016
Data Compression

Time: 3 hrs.

Max. Marks:100

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

PART – A

- 1 a. Define data compression. With an example, explain the process of modeling and coding. (06 Marks)
 - b. Develop a Huffman code for the character sequence 'zigzagzip' generated by a source. Draw the Huffman tree for the code. Compute the entropy of the source, average length of the Huffman code and its redundancy. (10 Marks)
 - c. Verify if the code {0, 10, 101, 001, 110, 1110} is uniquely decodable. (04 Marks)
 - 2 a. A receiver received some encoded symbols from channel that were encoded using LZW algorithm. The received symbols and initial dictionary are as given below.
Encoded symbols: 3 4 1 2 1 3 2 5 11 13 9 11.
- | Initial Dictionary | | | | | |
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- i) Decode the symbol sequence
 - ii) Reverse the decoded sequence and encode it using the same initial dictionary. (10 Marks)
 - b. Explain in detail, the coding schemes used in group – 3 facsimile apparatus. (10 Marks)
 - 3 a. Define autocorrelation. Write short note on ARMA (N,M) model. (06 Marks)
 - b. Briefly explain the function of a quantizer. Show that, for every bit being included in uniform quantizer of uniformly distributed source, the signal-to-noise ratio increases by 6dB. (10 Marks)
 - c. Highlight the various distortion criterions used in lossy compression schemes. (04 Marks)
 - 4 a. Explain vector quantization in detail. (08 Marks)
 - b. With necessary diagrams, explain Delta modulation. Also explain how the error developed can be avoided. (12 Marks)

PART – B

- 5 a. Find the inverse z-Transform of $F(z) = \frac{6z^2 - 9z}{z^2 - 2.5z + 1}$. (06 Marks)
- b. How are the elements of DCT and DST matrix represented? Derive the DWHT transform matrix. (06 Marks)
- c. Briefly explain the fundamental concept of the following in relation with Linear systems. Sealing, Time Invariance, Transfer Function, Impulse Response. (08 Marks)
- 6 a. With a neat block diagram, explain in detail the basic sub band coding algorithm. (10 Marks)
- b. With a block diagram, explain MPEG – 2 AAC encoder. (10 Marks)
- 7 a. Explain multi-resolution analysis and scaling function with an example. (10 Marks)
- b. With a neat diagram, explain SPIHT. (10 Marks)
- 8 a. With a neat diagram, explain H.261 video coding algorithm. (10 Marks)
- b. Explain H.264 advanced video coding. (10 Marks)

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