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**Question Paper Code : 71218**

M.E. DEGREE EXAMINATION, JUNE/JULY 2013.

Second Semester

Communication Systems

CU 9222/CU 922/10244 CM 202 – MULTIMEDIA COMPRESSION TECHNIQUES

(Common to M.E. Computer and Communication)

(Regulation 2009/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Compare vector quantization and scalar quantization.
2. List the features of multimedia.
3. Define Shannon-Fano coding algorithm.
4. Compare Huffman and arithmetic coding.
5. Define  $\mu$ -Law and A-Law companding.
6. What is meant by silence compression?
7. Define sub-band coding algorithm.
8. Compare EZW and SPIHT Coders.
9. List the profiles and levels of MPEG 2.
10. List the applications of MPEG4 and MPEG7.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe graphics and image data representations and list the applications of multimedia? (8)
- (ii) Discuss the evaluation techniques and the methodologies to analyse and evaluate the errors? (8)

Or

- (b) (i) Explain source coding and models with neat block diagram. (8)
- (ii) Explain the theory of scalar quantization, errors and its applications. (8)

12. (a) (i) For the following probability model, decode a sequence of length 10 with the tag 0.63215699. (8)

Letter	Probability
T1	0.2
T2	0.3
T3	0.5

- (ii) Generate the tag for the sequence 1 2 3 1 for the probabilities  $P(A) = 0.8, P(B) = 0.18, P(C) = 0.02$ . (8)

Or

- (b) (i) A source emits letters from an alphabet  $A = \{ a_1, a_2, a_3, a_4, a_5 \}$  with probabilities  $P(a_1) = 0.10, P(a_2) = 0.05, P(a_3) = 0.20, P(a_4) = 0.35,$  and  $P(a_5) = 0.30$

- (1) Calculate the entropy of this source.
- (2) Find a Huffman code for this source.
- (3) Find average length of the code and its redundancy. (8)

- (ii) A sequence is encoded using LZW algorithm and the initial dictionary is

Index	Entry
1	z
2	\$
3	l
4	w

The output of the LZW encoder is the following sequence

3 1 4 6 8 4 2 1 2 5 10 6 11 13 6

Decode this sequence. (8)

13. (a) (i) Describe the speech compression techniques with neat sketch. (8)
- (ii) Explain G.722 and its applications to audio coding. (8)

Or

- (b) (i) With neat sketch explain Code Excited Linear Prediction Vcoders. (8)
- (ii) Describe MPEG audio and discuss the applications to audio coding. (8)

14. (a) Discuss the following predictive techniques and their performance.
- (i) DM
  - (ii) PCM
  - (iii) DPCM. (16)

Or

- (b) Describe how an image is compressed using JPEG standard and compare it with JPEG 2000 and JBIG standards by their compression performance. (16)
15. (a) (i) Describe motion estimation and compensation with neat sketch. (8)
- (ii) With neat sketch, explain MPEG 1 and H.261 standard and compare them. (8)

Or

- (b) (i) Explain MPEG7 video standard with neat sketch. (8)
- (ii) Write short notes on Packet video and DVI technology. (8)
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