Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 60804

M.E. DEGREE EXAMINATION, MAY/JUNE 2017.

Elective

Communication Systems

NC 7002 — MULTIMEDIA COMPRESSION TECHNIQUES

(Common to M.E. Communication and Networking/M.E. Electronics and Communication Engineering and M.E. Optical Communication)

(Regulations 2013)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Examine whether the following systems have multimedia capability:
   (a) Radio, (b) Television, (c) Conventional wire-line telephone, (d) A modern computer,
2. Define vector quantization and give its merit over scalar quantization.
3. State Shannon Fano coding theorem.
4. Give some application of LZW?
5. State 'Nyquist Theorem' for audio standards.
6. What is meant by Companding?
7. Why most of the image compression standards are based on lossy?
8. What are the types of redundancies present in an image?
9. What is the key difference between I-frames, P-frames and B-frames in MPEG-2 video compression?
10. What is meant by motion compensation?

PART B — (5 × 13 = 65 marks)

11. (a) (i) Briefly explain scalar and vector quantization on multimedia compression. (6)

(ii) Explain in detail about the storage requirements of multimedia .(7)

Or

(b) Discuss the following image data types and file formats. 8- bit color Image, 24 bit color Image,GIF,, and PNG. (13)

12. (a) How will you encode block of symbols using Sliding window Dictionary. What are the variations of that method? (13)

Or

(b) How will you generate and decipher tag using Arithmetic coding. Explain with necessary equations. (13)

13. (a) (i) illustrate the sub band coding scheme for speech compression with suitable diagram. (10)

(ii) How does the G.722 standard supports for audio compression. (3)

Or

(b) With the necessary equations compare the performance of LPC with channel vocoders and CELP. (13)

14. (a) How does an Embedded Zero Tree coder efficiently represent the spatial location as multiple coefficient of other sub bands. Explain it for the following example? (13)

34	0	1	−1
0	0	−1	1
4	−4	10	−6
−4	4	6	−10

Or

(b) How will you compress images using JPEG algorithm. Explain with step by step procedure (13)

15. (a) Explain a MPEG 4 video standard with necessary blocks. (13)

Or

(b) Discuss in detail about the features of MPEG 1 and H.261. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Assume we are encoding the message [abracadabra] , where our alphabet consists of the 26 lower and upper case letters of the English alphabet. Draw the Adaptive Huffman tree and encode it. (15)

Or

(b) (i) Given the following initial dictionary and the received sequence below, build an LZW dictionary and decode the transmitted sequence. (8)

Received sequence: 3, 2, 1, 5,3, 4, 1, 6, 5

Initial dictionary:

Index	Entry
1	I
2	N
3	O
4	P

(ii) Encode the following sequence by LZ78 approach by keeping three symbols in the initial dictionary. *abracadabraabracadabra.* (7)