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Question Paper Code : 90441

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2022.

Sixth Semester

Electronics and Communication Engineering

EC 8002 – MULTIMEDIA COMPRESSION AND COMMUNICATION

(Regulations 2017)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Perform DPCM on a data sequence $\{8,10,10,10,13,12,14,16,15,19,20\}$ and compute its Compression Ratio.

2. Write the significance of subband coding in speech compression.

3. What is Tagged image file format?

4. How MPEG-2 motion estimation is performed?

5. For the image $f(x,y)$ shown below, compute the degree of compression that can be achieved using horizontal run length coding, assuming 2 bits to represent the pixel value and 2 bits to represent the run length

$$f(x,y)=\begin{bmatrix}4 & 4 & 4 & 3\\ 3 & 4 & 4 & 4\\ 4 & 3 & 3 & 3\\ 3 & 2 & 2 & 1\end{bmatrix}$$

6. To transmit an RGB image 512×512, 24 bpp via a modem at 56kb. Find the time taken to transmit?

7. Define Traffic shaping?

8. What is Laissez-faire approach?

9. What is end to end delay?

10. Write the types of Media Synchronization?

PART B — (5 × 13 = 65 marks)

11. (a) G.722 provides a high quality speech at 64kbps. How – Justify the statement.

Or

(b) Explain the structural properties and characterization of vector quantizer and also discuss the performance measurement of a vector quantizer.

12. (a) With neat sketch, Design ITU-T H.263 encoder and its Motion Compensation algorithms.

Or

(b) Discuss the design principles of JPEG standard with its transform computational features, Quantization and coding scheme.

13. (a) A source emits four symbols $\{a, b, c, d\}$ with the probabilities 0.4, 0.2, 0.1 and 0.3 respectively. Construct arithmetic coding to encode the word "dad".

Or

(b) A sequence is encoded using LZW algorithm and the initial dictionary shown in the table below.

Index	Entry
1	a
2	b
3	h
4	i
5	s
6	t

The encoder output sequence as follows: Decode the sequence

6 3 4 5 2 3 1 6 2 9

11 16 12 14 4 20 10 8 23 13

14. (a) Enumerate the significance of Resource Reservation Protocol with its principle and DiffServ architecture.

Or

(b) Discuss the principle of Best effort service model with its scheduling and dropping policies to achieve QoS.

15. (a) Demonstrate how Transport protocol addresses the transfer of real time digital streams and its system level issues.

Or

(b) Explain in detail about the data stream characteristics for continuous Media.

PART C — (1 × 15 = 15 marks)

16. (a) Encode and decode the following sequence using the LZ77 algorithm

dbcsbdbebcsbssbssbe

Assume a window size of 13 with look-ahead buffer size of 6 and search buffer of size 7.

Or

(b) Consider the message {b b r d v b r k}, where alphabet consist of 26 lower case letters of English alphabet and $(e = 4$ and $r = 10)$. Encode and decode the sequence using Adaptive Huffman coding.