CBCS SCHEME

USN ☐☐☐☐☐☐☐☐☐☐

17EC741

Seventh Semester B.E. Degree Examination, June/July 2024

Multimedia Communication

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-1

1 a. Explain five types of communication network that are used to provide multimedia services. **(10 Marks)**

b. Explain web page, home page, hyperlink, URL, HTML. **(10 Marks)**

OR

2 a. Explain the working principle of circuit mode and packet mode of operation of multimedia network. **(10 Marks)**

b. Determine the propagation delay associated with the following communication channels

i) A connection through a private telephone network of 1 km

ii) A connection through a PSTN of 200 km

iii) A connection over a satellites channel of 50,000km

Assume that the velocity of propagation of a signal in the case of : i) and ii) is $2 \times 10^{8}\text{ms}^{-1}$ and in the case of iii) $3 \times 10^{+8}\text{ms}^{-1}$. **(10 Marks)**

Module-2

3 a. Design a basic signal encoder with circuit components and associated waveforms. **(08 Marks)**

b. Discuss the following with relevant diagrams: (i) Additive mixing (ii) Subtractive mixing **(04 Marks)**

c. Explain the following HDTV formats with bit rates : (i) SIF (ii) QCIF **(08 Marks)**

OR

4 a. Write a note on CD quality audio. **(04 Marks)**

b. Derive the bit rate and memory requirements to store each frame that result from the digitization of both a 525 line and a 625 line system assuming a 4:2:2 format. Also find the total memory required to store a 2 hour movie/video. **(08 Marks)**

c. Explain the basic principle of PCM signal encoder/decoder with relevant waveforms. **(08 Marks)**

Module-3

5 a. A message comprising of a string of characters with probabilities e = 0.3, n = 0.3, t = 0.2, w = 0.1, · = 0.1 is to be encoded. The message is "went." Compute the arithmetic code word. **(08 Marks)**

b. With the aid of diagrams, explain JPEG encoder. **(08 Marks)**

c. Explain CPU management in multimedia operating system. **(04 Marks)**

OR

6 a. A message and its probability of occurrence of each character is as follows:

A and B = 0.25, C and D = 0.14, E, F, G and H = 0.055.

(i) Use Shannon's formula to derive the minimum average number of bits per character.

(ii) Construct the Huffman code tree and derive a suitable set of code word. **(08 Marks)**

b. Explain the principle of LZW compression. **(06 Marks)**

c. Explain the main features of distributed multimedia system. **(06 Marks)**

Module-4

7 a. With a neat diagram, explain video compassion principles. (08 Marks)
b. Explain MPEG – 4 coding principles. (06 Marks)
c. Explain linear predictive coding. (06 Marks)

OR

8 a. Explain H.261 encoding formats. (08 Marks)
b. Explain how better sound quality can be obtained by using subband DPCM with the help of block diagram of encoder and decoder. (06 Marks)
c. Write a note on audio compression. (06 Marks)

Module-5

9 a. Illustrate basic reconstruction approaches used in packet voice with advantages and disadvantages. (06 Marks)
b. Write a note on error resilient encoding. (04 Marks)
c. Explain different multiplexing schemes used in ATM networks. (10 Marks)

OR

10 a. Explain scalable rate control with neat block diagram. (10 Marks)
b. Explain the concept of layered video coding with relevant diagrams. (06 Marks)
c. Write a note on packet video. (04 Marks)

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