USN
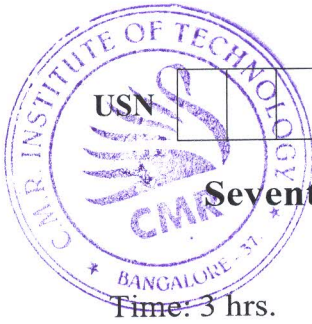
Seventh Semester B.E. Degree Examination, Dec.2023/Jan.2024
Multimedia Communication

Time: 3 hrs.

Max. Marks: 100

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

Module-1

1   a. Define Multimedia. Explain Integrated Service Digital Network (ISDN) in detail with figures. **(06 Marks)**
    b. Explain text-and-image Computer Supported Cooperative Working (CSCW). **(06 Marks)**
    c. Explain centralized, decentralized and hybrid mode multipoint conferencing. **(08 Marks)**

OR

2   a. Explain the operational modes of communication channel with relevant diagram. **(06 Marks)**
    b. What is network QoS? Discuss the QoS parameters for packet switched network. **(08 Marks)**
    c. Determine the propagation delay associated with the following communication channels:
      (i) A connection through private telephone network of 500 meters.
      (ii) A connection through a PSTN of 100 km.
      (iii) A connection over satellite channel of 25,000 km.
      Assume velocity of signal in (i) and (ii) is $2 \times 10^8 \, ms^{-1}$ and in (iii) $3 \times 10^8 \, ms^{-1}$. **(06 Marks)**

Module-2

3   a. Explain different types of text with neat diagram. **(08 Marks)**
    b. Explain color principles. **(06 Marks)**
    c. Derive the time to transmit the following digitized image at both 64 Kbps and 1.5 Mbps.
      (i) A $640 \times 480 \times 8$ VGA compatible image.
      (ii) A $1024 \times 768 \times 24$ SVGA comparable image. **(06 Marks)**

OR

4   a. Explain 4:2:2 and 4:2:0 digitization format with relevant diagram. **(08 Marks)**
    b. Derive the scaling factors used for both U and V (as used in PAL) and I and Q (as used in NTSC) color difference signals in terms of R, G, B signals. **(06 Marks)**
    c. Define:
      (i) Aspect ratio   (ii) Pixel depth
      (iii) Frame refresh rate   (iv) Progressive scanning **(06 Marks)**

Module-3

5   a. Explain transform coding with the relevant diagram. **(06 Marks)**
    b. Use static Huffman coding to derive codewords for "AAAABBCD". **(06 Marks)**
    c. Explain multimedia operating system. **(08 Marks)**

OR

6   a. Explain the principle of operation of JPEG encoder. **(10 Marks)**
    b. Find the codeword range for the message ·went. , their probabilities are as follows:
      e = 0.3, n = 0.3, t = 0.2, w = 0.1, · = 0.1 **(10 Marks)**

Module-4

7   a. Explain DPCM encoder/decoder schematic with encoder timing.   (10 Marks)
    b. Explain MPEG perceptual encoder/decoder implementation schematic with frame format example.   (10 Marks)

OR

8   a. Explain H.261 macroblock format, frame/picture format and GOB structure.   (10 Marks)
    b. Explain linear predictive coding signal encoder and decoder with relevant diagram.   (10 Marks)

Module-5

9   a. With neat block diagram, explain Scalable Rate Control (SRC).   (10 Marks)
    b. Explain multiplexing in ATM network.   (10 Marks)

OR

10 a. Explain packet video in detail.   (10 Marks)
    b. Explain in brief errors and losses in ATM.   (10 Marks)

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