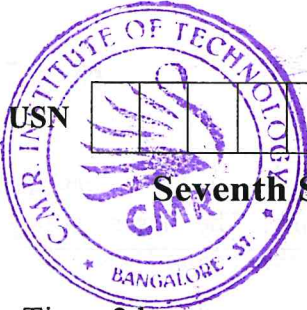USN | | | | | | | | | | | | 15EC741

Seventh Semester B.E. Degree Examination, Jan./Feb. 2021
Multimedia Communication

Time: 3 hrs.   Max. Marks: 80

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.   List out the different types of multimedia networks used to provide Multimedia services.   **(03 Marks)**

    b.   With a neat diagram, explain Telephone Network and Broadcast Television Network.   **(08 Marks)**

    c.   Determine the propagation delay associated with the following communication channels. Assume that the velocity of propagation of a signal in the case of i) 4   ii) is $2 \times 10^8 ms^{-1}$ and iii) is $3 \times 10^8 ms^{-1}$.
      1. A connection through a private network of 1km
      2. A connection through a PSTN of 200km
      3. A connection over a satellite channel of 50,000km.   **(05 Marks)**

OR

2   a.   Find the maximum block size that should be used over a channel which has mean BER probability of 10^{-4}. If the probability of a block containing an error and hence discarded to be 10^{-1}.   **(03 Marks)**

    b.   Describe the additional service provided by public and private networks other than telephony.   **(08 Marks)**

    c.   With a neat diagram, explain the Image only Interpersonal communication.   **(05 Marks)**

Module-2

3   a.   With a neat diagram, explain the signal encoding and decoding using PCM principles.   **(09 Marks)**

    b.   Assuming the bandwidth of a speech signal is from 50Hz through to 10KHz and that of a music signal is from 15Hz through to 20KHz, determine procedure in each case assuming Nyquist sampling rate is used with 12bits per sample for the speech signal and 16bits per sample for music signal. Derive the memory required to store a 10 minute passage of a stereophonic music.   **(07 Marks)**

OR

4   a.   Explain 4:2:2 and 4:2:0 digitization formats.   **(08 Marks)**

    b.   Describe with a neat schematic color image capture using Digital Camera and Scanner.   **(08 Marks)**

Module-3

5   a.   Describe GIF (Graphic Interchange Format) with relevant diagrams and also describe the modes.   **(08 Marks)**

    b.   Derive the code for string "went." Comprising characters with probability of e = 0.3, n = 0.3, t = 0.2, w = 0.1, • = 0.1 using Arithmetic coding.   **(08 Marks)**

OR

6 a. With a net Schematic, explain JPEG Encoder. **(09 Marks)**
   b. Derive the output code using LZW compression algorithm. The input string is ABABBABCABABBA for the initial dictionary containing only three characters with code as follows :

   Code String
   1   A
   2   B
   3   C

   (07 Marks)

Module-4

7 a. Explain with a neat diagram, ADPCM sub band encoder and decoder. **(08 Marks)**
   b. Explain with relevant diagrams, sensitivity of the ear, frequency and temporal masking used in perceptual coding. **(08 Marks)**

OR

8 a. Illustrate with a neat diagram, Dolby AC -2 and hybrid backward/forward adaptive bit allocation. **(08 Marks)**
   b. Explain the principles of video compression and also different frame types used. **(08 Marks)**

Module-5

9 a. Explain the NTI and CTI reconstruction schemes. **(08 Marks)**
   b. Discuss the network design issues that directly affect video transmission. **(08 Marks)**

OR

10 a. Discuss Simulcast coder and layered coder in layered compression. **(08 Marks)**
    b. Explain with block diagram, the video streaming architecture. **(08 Marks)**

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