



## Seventh Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025 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. Describe with the aid of a diagram, how a PSTN can support range of Multimedia Common Applications. (10 Marks)
- b. Classify five types of Communication network that are used to provide multimedia services. (10 Marks)

**OR**

- 2 a. Discuss the term interactive television with the help of a neat diagram. (10 Marks)
- b. Outline the communication modes available to transfer the information stream. (10 Marks)

### Module-2

- 3 a. Describe the function of signal encoder with the associated waveform. (10 Marks)
- b. Assuming the bandwidth of a speech signal is from 50 Hz through to 10 KHz and that of a music signal is from 15 Hz through to 20 KHz, compute the bit rate that is generated by the digitization procedure in each case assuming the Nyquist sampling rate is used with 12 bits per sample for the speech signal and 16 bits per sample for the music signal. Derive the memory required to store a 10 min passage of stereophonic music. (10 Marks)

**OR**

- 4 a. Outline Raster – Scan operation associated waveform. (10 Marks)
- b. Calculate the time to transmit the following digitized images 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 – Compatible image. (10 Marks)

### Module-3

- 5 a. A series of messages is to be transferred between Two Computers over a PSTN. The messages comprises just the characters A through H. Analysis has shown that the probability (relative frequency 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 calculate the minimum average number of bits per character.
  - ii) Use Huffman coding to compute a code work set and show that this is the minimum set by constructing the corresponding Huffman code tree. (10 Marks)
- b. Describe JPEG Encoder with the aid of diagrams. (10 Marks)

**OR**

- 6 a. Derive the code for the string "went". Comprising characters with probability of  $e = 0.3$ ,  $n = 0.3$ ,  $t = 0.2$ ,  $w = 0.1$ ,  $\bullet = 0.1$ , using Arithmetic coding. (10 Marks)
- b. Discuss GIF and TIFF format. (10 Marks)

**Module-4**

- 7 a. Describe DPCM encoder and decoder with a neat diagram. (10 Marks)  
b. A digitized video is to be compressed using the MPEG – I standard. Assuming a frame sequence of 1 B B P B B P B B P B B 1..... and average compression ratio of 10:1(I) , 20 : 1(P) and 50:1(B), calculate the average bit rate that is generated by encoder for both the NTSC and PAL digitization formats. (10 Marks)

**OR**

- 8 a. Describe linear predictive coding encoder and decoder with neat schematic. (10 Marks)  
b. Illustrate H-261 Video encoder principles with a necessary diagram. (10 Marks)

**Module-5**

- 9 a. Discuss the frame format and operational parameters of Ethernet / IEEE 802.3. (10 Marks)  
b. Describe the physical and MAC sub – layer of LAN protocol. (10 Marks)

**OR**

- 10 a. Compare the LAN protocols and Protocol framework. (10 Marks)  
b. Describe in detail with diagrams the token ring configuration , frame formats , frame transmission and reception with priority operation. (10 Marks)

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