

CBCS SCHEME

15EC741



Seventh Semester B.E. Degree Examination, Dec.2019/Jan.2020 Multimedia Communication

Time: 3 hrs.

Max. Marks: 80

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

Module-1

- 1 a. Discuss the different types of communication network that are used to provide multimedia communication service. (08 Marks)
- b. Explain the communication modes available to transfer the information stream. (08 Marks)

OR

- 2 a. Determine the propagation delay associated with the following communication channels.
 - i) A connection through a private telephone network of 1km
 - ii) A connection through a PSTN of 200km
 - iii) A connection over a satellite channel of 50,000kmassume that the velocity of propagation of a signal in case of i) and ii) is $2 \times 10^8 \text{ms}^{-1}$ and in case iii) $3 \times 10^8 \text{ms}^{-1}$. (06 Marks)
- b. Explain the QoS parameter associated with a packet-switched network. (06 Marks)
- c. Discuss any one entertainment application of multimedia. (04 Marks)

Module-2

- 3 a. Illustrate the different types of text data representation. (06 Marks)
- b. Calculate the time to transmit the following digitized images at both 64kbps and 1.5mbps.
 - i) A $640 \times 480 \times 8$ VGA – compatible image
 - ii) A $1024 \times 768 \times 24$ SVGA – compatible image. (06 Marks)
- c. The band width of speech signal is from 50Hz through to 10KHz and that of a music signal is from 15Hz through to 20KHz. Compute the bit rate that is generated by the digitization procedure by assuming the Nyquist sampling rate of 12 bits per sample for speech signal and 16 bits per sample for the music signal. (04 Marks)

OR

- 4 a. Assuming the CD-DA standard is being used, compute the time to transmit a 30 second portion of the title using a transmission channel of bit rate : i) 64 kbps ii) 1.5 Mbps. (04 Marks)
- b. With the aid of block diagram explain PCM signal encoding and decoding principle. (08 Marks)
- c. Why is the chrominance signal transmitted in the form of two color different signals? Identify the color difference signals associated with the NTSC and PAL systems. (04 Marks)

Module-3

- 5 a. A message and its probability of occurrence of each character is of follows :
A and B = 0.25, C and D = 0.14, E, F, G and H = 0.055.
 - i) Find the minimum average number of bits per character using Shannon's formula.
 - ii) Construct Huffman code tree and derive a code word set. (08 Marks)
- b. Define distributed multimedia system with neat block schematic and also highlight its features. (08 Marks)

OR

- 6 a. Discuss multimedia operating system with respect to CPU management, memory management, I/O management and file system management. (08 Marks)
b. With the aid of neat block diagram explain JPEG encoder. (08 Marks)

Module-4

- 7 a. Discuss the principles of differential pulse code modulation with neat block diagram. (08 Marks)
b. Using block diagram explain h-261 video-encoder principles. (08 Marks)

OR

- 8 a. Explain principle of linear predictive coding with neat block schematic. (08 Marks)
b. A digitized video is to be compressed using the MPEG – 1 standard. Assuming a frame sequence of: IBBPBBPBBPBBI.
And average compression ratio of 10 : 1(I), 20 : 1(P) and 50 : 1(B), derive the average bit rate that is generated by the encoder for both NTSC and PAL digitization formats. (08 Marks)

Module-5

- 9 a. Explain video-streaming architecture with neat block diagram. (08 Marks)
b. Discuss the protocol stacks for media streaming using block diagram. (08 Marks)

OR

- 10 a. Using neat block diagram how distortion is measured in terms of quantization parameter in R(D) model. (08 Marks)
b. Explain the different instances that may cause the end-to-end delays in ATM network. (08 Marks)
