



CBCS SCHEME

15EC741

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Seventh Semester B.E. Degree Examination, June/July 2019

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. Define multimedia. Explain: i) Telephone network ii) Integrated Service Digital Network (ISDN) in detail with figures. (06 Marks)
- b. Explain with neat diagram multipoint conferencing modes and type of conferencing. (06 Marks)
- c. Determine the propagation delay associated with the following communication channels:
- A connection through a private telephone network of 1km.
 - A connection through PSTN of 200km
 - A connection over a satellite channel of 50,000km. (04 Marks)

OR

- 2 a. Explain the working principle of circuit mode and packet mode of operation of multimedia network. (06 Marks)
- b. Explain multimedia applications. (06 Marks)
- c. Define the following: i) Text ii) Image iii) Audio iv) Video (04 Marks)

Module-2

- 3 a. Explain clearly different types of text data representation. (06 Marks)
- b. Derive the time to transmit the following digitized images at both 64Kbps and 1.5Mbps
- * a $640 \times 480 \times 8$ VGA compatible image
 - * a $1024 \times 768 \times 245$ VGA compatible image. (04 Marks)
- c. Describe Raster scan operation associated with TV/computer monitor. (06 Marks)

OR

- 4 a. Explain the principle of operation of PCM speech code with block diagram. (06 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, derive 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 bit per sample for the Music signal. Derive the memory required to store a 10 minute passage of stereophonic music. (06 Marks)
- c. Explain: i) Quantization Interval ii) Aspect ratio. (04 Marks)

Module-3

- 5 a. Explain the meaning of the term relating to compression i) Losses and lossy compression. (06 Marks)
- b. A series of messages is to be transmitted between computers over a PSTN. The messages comprise the characters A through H. The probability of each character is as follows. A and B = 0.25 C and D = 0.14 E, F, G and H = 0.055.
- Using Shanon's formula to derive the minimum average number of bits/character.
 - Use Huffman coding to derive the codeword and prove that this is the minimum set by constructing the corresponding Huffman code tree. (06 Marks)
- c. Explain the main features of distributed multimedia system. (04 Marks)

OR

- 6 a. With the help of a block diagram, identify the five main stages associated with the base line mode of operation of JPEG encoder and give a brief description of the role of Image/Block preparation. (06 Marks)
- b. Explain with neat diagram forward DCT. (06 Marks)
- c. What is multimedia operating system? (04 Marks)

Module-4

- 7 a. Explain how better sound quality can be obtained by using subband DPCM with the help of block diagram of encoder and decoder. (06 Marks)
- b. Explain H.261 encoding formats. (06 Marks)
- c. A digitized video is to be compressed using 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 the NTSC and PAL digitization formats. (04 Marks)

OR

- 8 a. Explain MPEG – 4 coding principles with the help of a neat diagram. (06 Marks)
- b. With a neat diagram, explain video compression principles. (06 Marks)
- c. Explain predictive coding. (04 Marks)

Module-5

- 9 a. Explain packet audio and video in the network environment. (06 Marks)
- b. Explain video transport across generic network. (06 Marks)
- c. Write a short note on analytic mode based approach. (04 Marks)

OR

- 10 a. Explain packet video in detail. (06 Marks)
- b. Explain error resilient video coding. (06 Marks)
- c. Write a short note on Error losses ATM. (04 Marks)
