18EC743

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Seventh Semester B.E. Degree Examination, June/July 2025
Multimedia Communication

Max. Marks: 100

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

Module-1

1 a. Explain five types of communication network that are used to provide multimedia services. (10 Marks)
   b. Explain different multimedia applications. (10 Marks)

OR

2 a. Explain the working principle of circuit mode and packet mode of operation of multimedia network. (10 Marks)
   b. Describe the propagation delay associated with the following communication channels.
      i) A connection through a private telephone network of 1 km
      ii) A connection through a PSTN of 200 km
      iii) A connection over a satellite channel of 50,000 km
      Assume that the velocity of propagation of a signal in the case of :
      i) and ii) is $2 \times 10^8 \, ms^{-1}$ and in the case of iii) $3 \times 10^8 \, ms^{-1}$. (10 Marks)

Module-2

3 a. Explain different type text data representation. (10 Marks)
   b. Derive the time to transmit the following digitized images at both 64 kmps and 1.5 Mbps
      i) A $640 \times 480 \times 8$ VGA compatible image (10 Marks)
      ii) A $1024 \times 768 \times 24$ SVGA compatible image. (10 Marks)

OR

4 a. With the aid of block diagram, explain PCM signal encoding and decoding principle. (10 Marks)
   b. Assuming the bandwidth of a speech signal is from 50Hz through to 10KHz and that of a signal from 15 Hz to 20 KHz, derive the bit rate that is generated by the digitization procedure in each assuming the Nyquist sampling rate used is 12 bits per sample for speech signal and 16 bits per sample for music signal. Derive the memory required to store a 10 minutes passage of stereophonic music? (10 Marks)

Module-3

5 a. Explain different compression principles. (10 Marks)
   b. Explain Arithemtic Coding with an example. (10 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. What is multimedia operating system? (06 Marks)
   c. Explain main features of a DMS. (06 Marks)

Module-4

7 a. Explain Linear predictive coding. (10 Marks)
   b. A digitizied video is to be compressed using MPEG – 1 standard. Assuming a frame sequence of :
      IBBPBBPBBPBBI
      And average compression ratios of 10 : 1(I), 20 : 1(P) and 50 : 1(B), derive the average bit rate that is generated by the encoder for NTSC and PAL digitization formats. (10 Marks)

OR

8 a. Explain MPEG-4 Coding Principles. (10 Marks)
   b. Explain Adaptive Differential PCM. (10 Marks)

Module-5

9 a. Assuming a single propogation delay in the fiber of 5 µs per 1 km. Derive the latency of the following FDDI ring configurations in both time and bits assuming a usable bit rate of 100 Mbps.
      i) 2 km ring with 20 stations
      ii) 20 km ring with 200 stations
      iii) 100 km ring with 500 stations (10 Marks)
   b. Explain LAN Protocols. (10 Marks)

OR

10 a. Explain IP Datagrams with neat diagram. (10 Marks)
    b. Explain Static Routing. (10 Marks)

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