

CBCS SCHEME

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18EC743

Seventh Semester B.E. Degree Examination, July/August 2022 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. Explain with a neat diagram, the Interactive television application for both cable and satellite network. (10 Marks)
- b. With the help of a diagram, describe the main components of PSTN and show how a high speed modem provides multiple services in addition to basic telephony. (10 Marks)

OR

- 2 a. Define Network Quality of Service parameters. Explain Packet Switched Network parameters. (08 Marks)
- b. Determine the propagation delay associated with the following communication channel :
- i) Connection through private telephone network of 1 km.
 - ii) Connection through a PSTN of 200 km.
 - iii) Connection over a satellite channel 50000 km. Assume velocity of propagation of a signal in case of (i) and (ii) 2×10^8 m/sec iii) 3×10^8 m/sec. (12 Marks)

Module-2

- 3 a. With the help of a diagram, explain how a digital image produced by a scanner or digital camera is captured and stored within the memory of a computer. (10 Marks)
- b. Explain the principle of operation of a PCM speech codec, with a block diagram also explain the compressor and expander. (10 Marks)

OR

- 4 a. With the help of a diagram, explain the principles of Interlaced of scanning as used in most TV broadcast applications. (10 Marks)
- b. Assuming the CD – DA standard is being used. Derive
- i) The storage capacity of a CD – ROM to store 60 minutes of multimedia title.
 - ii) The time to transmit a 30 sec portion of the title using a transmission channel of bit rate 64 kbps and 1.5 Mbps. (10 Marks)

Module-3

- 5 a. Explain the meaning of the following terms relating to text compression algorithms :
- i) Static coding ii) Dynamic / Adaptive coding. (08 Marks)
- b. How the coding operation takes place in arithmetic coding? Consider the transmission of a message comprising a string of characters with probabilities.
- $e = 0.3$, $n = 0.3$, $t = 0.2$, $w = 0.1$, $\cdot = 0.1$. The word needed to be transmitted is went. (12 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. Compress the following string using LZW algorithm. "ABABBABCABABBA". (12 Marks)

Module-4

- 7 a. Explain with the help of diagram for the signal encoder and decoder and explain how better sound quality for the same bit rate can be obtained using a sub – band coding ADPCM. (10 Marks)
- b. With the help of example frame sequences. Explain the meaning of the following types of compressed frame and the reasons for their use :
- i) I – frame ii) P – frame iii) B – frame. (10 Marks)

OR

- 8 a. Explain with diagram H.261, explain the role and operation of the quantization control block. (10 Marks)
- b. Solve a digitized video to be compressed using the MPEG – 1 standard assuming a frame sequence of IBBPBBPBBPBBI... and average compression ratio of
 $10 : 1 \rightarrow$ I frame , $20 : 1 \rightarrow$ P frame , $50 : 1 \rightarrow$ B frame.
 Derive the average bit rate that is generated by the encoder for both the NTSC and PAL digitization formats. (10 Marks)

Module-5

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

OR

- 10 a. Describe the operation of ARP and RARP. (10 Marks)
- b. Explain Fragmentation and Reassembly in the internet in detail. (10 Marks)

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