16230(D) - 0 DEC 2016

B. Tech 7th Semester Examination

Multimedia Technology (NS)

CS-411(a)

Time : 3 Hours   **Max. Marks : 100**

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Candidates are required to attempt five questions in all selecting one question from each of the section A, B, C and D of the question paper and all the subparts of the question in section E. Use of non-programmable calculator is allowed.

SECTION - A

1. Give a definition of *multimedia* and a *multimedia system*. What are the key distinctions between multimedia data and more conventional types of media? Also explain key issues or problems does a multimedia system have to deal with when handling multimedia data?   (20)

2. What is MIDI? How is a basic MIDI message structured? In what ways can MIDI be used effectively in Multimedia Applications, as opposed to strictly musical applications? What are the two main kinds of MIDI messages? Can a single MIDI message cause more than one note to sound?   (20)

SECTION - B

3. What is a colour look-up table and how is it used to represent colour? Give an advantage and a disadvantage of this representation with respect to true colour (24-bit) colour.? How

does the human eye sense colour? What characteristics of the colour sensory operators of human visual system can be exploited for the compression of colour images and video?
                                      (20)

4. Briefly outline the basic principles of Inter-Frame Coding in Video Compression. Also explain what is the key difference between I-Frames, P-Frames and B-Frames? Why are I-frames inserted into the compressed output stream relatively frequently? (20)

SECTION - C

5. Why is data compression necessary for Multimedia activities? What is the distinction between lossless and lossy compression? What broad types of multimedia data are each most suited to? Briefly explain the compression techniques of zero length suppression and run length encoding. Give one example of a real world application of each compression technique.   (20)

6. Consider the following DNA fragment:

    ...GTACCCGACACTTCCGTCCCCTTC...assume that the frequencies of symbols in the rest of the sequence are the same as in this fragment. Estimate the probabilities of each symbol {A, G, T, C} and hence derive the Huffman code for each. Estimate the average number of bits per symbol required to encode the sequence using Huffman code under these circumstances. What advantage does arithmetic coding offer over Huffman coding for data compression?   (20)

SECTION - D

7. Discuss the use of text in multimedia. Explain the term hypermedia and Hypertext? How does hypermedia messages are created and linked? Also explain what are the standards for integrated multimedia messages?   (20)

8. What are the components of distributed multimedia systems? Explain multi server network topologies. How to incorporate multimedia in distributed object oriented system? (20)

SECTION - E

9. Write short note on following:

   (a) Huffman Compression

   (b) JPEG Compression

   (c) MPEG Compression

   (d) Multimedia vs. Hypermedia

   (e) Digital audio file formats

   (f) MIDI specifications

   (g) Video Compression

   (h) Frequency and Temporal Masking

   (i) Nyquist's Sampling Theorem

   (j) LZW Compression algorithm　　　　　(10×2=20)