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12EC052

M.Tech. Degree Examination, June/July 2014
Multimedia Communication

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

- 1 a. Define multimedia. Discuss the different types of data and challenges involved in multimedia communication. (10 Marks)
- b. Briefly explain five basic types of communication networks that are used to provide multimedia communication services. (10 Marks)
- 2 a. 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? (08 Marks)
- b. Identify and explain the meaning of the key QoS parameters associated with the following network types: i) Circuit switched ; ii) Packet switched. Also explain the parameters associated with application QoS. (10 Marks)
- c. What is meant by the terms multimedia and hypermedia? Distinguish between these two concepts. (02 Marks)
- 3 a. Show how you would use Huffman coding to encode the following set of tokens: B A B A C A C A D A D A B B C B A B E B E D D A B E E E B B. How is this message transmitted when encoded? How many bits are needed to transfer this coded message and what is its entropy? (10 Marks)
- b. Encode the following stream of characters using arithmetic coding compression MEDIA. Assume that characters occur with probabilities of M = 0.1, E = 0.3, D = 0.3, I = 0.2 and A = 0.1. Show how your solution would be decoded. (10 Marks)
- 4 a. Briefly outline the basic principles of inter frame coding in video compression. What is the key difference between I-frames, P-frames and B-frames? (10 Marks)
- b. How does MPEG audio compression exploit the phenomena of frequency and temporal masking of two or more audio signals? Give a schematic diagram of the MPEG audio perpetual encoder. (10 Marks)
- 5 a. 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.
 - i) Use Shanon's formula to derive the minimum average number of bits/character.
 - ii) Use Huffman coding to derive the codeword and prove that this is the minimum set by constructing the corresponding Huffman code tree. (14 Marks)
- b. Describe MPEG-1 standard. (06 Marks)
- 6 a. Describe the use of RTP protocol and by means of a diagram, show its position in relation to the TCP/IP protocol stack. (10 Marks)
- b. List and give an explanation of the four main functions performed by RTCP. (08 Marks)
- c. Mention the use of DVMRP. (02 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
 2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

- 7 a. In MPEG-4 compression standard explain the role of i) transport stream; ii) Flexmux layer; iii) Synchronization layer; iv) Decomposition layer; v) Composition and rendering layer. (10 Marks)
- b. With an appropriate example explain the basic synchronization issues. (10 Marks)
- 8 a. State the significant features of JPEG 2000. (06 Marks)
- b. Explain the salient features of GIF and TIFF. (06 Marks)
- c. With the help of an encoder/decoder draw schematic diagram explain the principles of DPCM. (08 Marks)
