M.Tech. Degree Examination, Dec.2013/Jan.2014
Multimedia Communication

Time: 3 hrs.   Max. Marks:100

Note: *Answer any FIVE full questions.*

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

   b. Determine the propagation delay associated with the following communication channels:
     (i) a connection through a private telephone network of 10 km.
     (ii) a connection through a PSTN of 500 km.
     (iii) a connection through a satellite channel of 75,000 km.
     Assume that the velocity of propagation of a signal in the case of (i) & (ii) is 2×10^8 ms^{-1} and in the case of (iii) 3×10^8 ms^{-1}. **(06 Marks)**

   c. Differentiate between voice-operated switching mode and continuous-presence mode. **(04 Marks)**

2 a. Explain the network QoS associated with different types of network. **(10 Marks)**

   b. With the aid of a diagram, explain the meaning of the following terms relating two packet-switched network:
     (i) packetization delay   (ii) mean packet transfer delay   (iii) jitter
     Describe, how the effects on a constant bit-rate stream of packetization delay and jitter can be overcome by buffering. **(10 Marks)**

3 a. State the types of text that are used to produce pages of documents. Explain any one of them. **(07 Marks)**

   b. With neat schematic, explain the different alternative methods for RGB signal generation. **(09 Marks)**

   c. Assuming the CD-DA standard is being used, derive
     (i) the storage capacity of CD-ROM to store a 60 minute multi-media title.
     (ii) the time to transmit a 30 second portion of the title using a transmission channel of bit-rate 1.5 Mbps. **(04 Marks)**

4 a. Derive the bit rate and the memory requirements to store each frame that result from the digitization of both 525-line and a 625-line system assuming a 4:2:2 format. Also, find the total-memory requirement to store a 2 hour movie/video. **(08 Marks)**

   b. Compare Huffman coding and Arithmetic coding, used for data compression. **(04 Marks)**

   c. Message comprising of eight different characters, A through H, are to be transmitted over a data link. Analysis has shown that the relative frequency of occurrence of each character is:
     A = 0.10;   B = 0.125;   C = 0.125;   D = 0.05;   E = 0.32;   F = 0.01;   G = 0.07;   H = 0.2
     (i) Derive the entropy of the messages.
     (ii) Use static Huffman coding to derive a suitable set of codewords.
     (iii) Derive the average number of bits per codeword. **(08 Marks)**