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12EC052

M.Tech. Degree Examination, Dec.2014/Jan.2015
Multimedia Communication

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. Define the term multimedia. List different types of multimedia networks. Explain any two networks in detail. **(10 Marks)**

b. Identify and explain the meaning of key QOS parameters associated with circuit switching and packet switching. **(10 Marks)**

2 a. Derive the time to transmit the following digitized image at both 64 kbps and 1.5 Mbps:
i) a 640 × 480 × 8 VGA compatible image.
ii) a 1024 × 768 × 24 SVGA compatible image. **(04 Marks)**

b. Derive the memory required to store a 10 minute passage of stereophonic music. Assume bandwidth of music as 15Hz through to 20kHz and Nyquist sampling rate as 16 bits per sample. **(04 Marks)**

c. With the help of a neat diagram, explain audio synthesizer. **(08 Marks)**

d. Explain 4:2:2 digitization format. **(04 Marks)**

3 a. Consider transmission of a message comprising a string of characters with probabilities of e = 0.3, n = 0.3, t = 0.2, w = 0.1, · = 0.1. Encode the string "went." using arithmetic coding. **(10 Marks)**

b. With the help of a block diagram, identify the five main stages associated with baseline mode of operation of JPEG encoder. Give a brief description of role of image/block preparation and forward DCT. **(10 Marks)**

4 a. Draw the block diagram of H.261 video encoder and explain the role of FIFO buffer and associated high and low threshold values. **(10 Marks)**

b. With the aid of example of frame sequences, explain the meaning of following types of compressed frame and reasons for their use: i) I-frames; ii) P-frames; iii) B-frames. **(10 Marks)**

5 a. Explain MPEG-4 encoder and decoder schematic with a neat diagram. Also explain the meaning of scene and object descriptions, scene composition and rendering and texture, motion and shape encoding in this relation. **(10 Marks)**

b. With the aid of the diagram, explain:
i) How reversible variable length codeword's (RVLCS) reduce the effect of transmission errors.
ii) The derivation of RVLCS.
iii) Forward and reverse scans and their use. **(10 Marks)**

6 a. Explain the principle of operation of LZ compression algorithm. Hence assuming a dictionary of 25,000 words and an average word length of 10 bits, calculate the average compression ratio that is achieved relative to using 7-bit. ASCII codewords. Also explain the principle of operation of LZW compression algorithm and how this is different from LZ algorithm. **(12 Marks)**

b. A series of messages is to be transmitted between computers over a PSTN. 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. Use Huffman coding to derive the codeword. **(08 Marks)**

7 a. Explain reference model for synchronization, with a neat diagram. **(06 Marks)**

b. Give the packet format of RTP and describe its usage. **(10 Marks)**

c. Explain RSVP in brief. **(04 Marks)**

8 Write short notes on:

a. Significant features of JPEG 2000.

b. DVMRP.

c. Resource Management Techniques.

d. Multimedia in broadcast networks. **(20 Marks)**

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