

USN

--	--	--	--	--	--	--	--	--	--

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  $640 \times 480 \times 8$  VGA compatible image. (04 Marks)  
ii) a  $1024 \times 768 \times 24$  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  $e = 0.3, n = 0.3, t = 0.2, w = 0.1, \cdot = 0.1$ . 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)

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.

- 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)