Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – III • EXAMINATION – WINTER • 2014

Subject code: 734103 **Date: 27-11-2014**

Subject Name: Multimedia Signal Processing and Communication

Time: 02:30 pm - 05:00 pm **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Explain in brief about multimedia signals.	**07**
	(b)	Explain about elements of basic block diagram of multimedia system.	**07**
Q.2	**(a)**	Consider the case where in one want to transmit color image of 1024×1024 pixels over a telephone channel supported with modem having speed 28.8 Kbits/second. Assuming 36 bits for each pixel (12 bits for each color R, G, B), compute the total number of bits required to transmit the entire image and the time required to transmit the image. What will be the time required to transmit the same image if the speed is increased to 64 Kbits/second?	**07**
	(b)	Explain basic principles of Huffman Coding and demonstrate with suitable example that how can it be used for text compression.	**07**
		OR	
	(b)	Explain about Run Length Coding with suitable example.	**07**
Q.3	**(a)**	Compare the lossy and lossless image compression methods.	**07**
	(b)	Explain basic principles of operation of LZW coding method with suitable example.	**07**
		OR	
Q.3	**(a)**	Compare arithmetic coding and Huffman coding methods.	**07**
	(b)	Write down steps to convert gray scale image into bit planes. Which bit plane contains the most of the information?	**07**
Q.4	**(a)**	What are the requirements of low bit rate audio coders? Explain MPEG standards.	**07**
	(b)	What is a masking phenomena? Explain the terms SMR and MNR with reference to SPL.	**07**
		OR	
Q.4	**(a)**	Explain about perception based coder with block diagram.	**07**
	(b)	Explain about three layers of audio compression.	**07**
Q.5	**(a)**	Explain about multimedia synchronization with emphasis on intra media and inter media synchronization.	**07**
	(b)	Define and explain PTS and DTS with reference to multimedia synchronization.	**07**
		OR	
Q.5	**(a)**	Explain in brief about video coding standards.	**07**
	(b)	Show flow chart for pattern matching and substitution and soft pattern matching algorithms.	**07**

****