Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M.E Sem-I Regular Examination January / February 2011

Subject code: 713103N

Subject Name: Biomedical Image Processing

Date: 02 /02 /2011 **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 structure of eye.	**07**
	(b)	Explain image sampling and quantization.	**07**
Q.2	**(a)**	Explain 2D Discrete time Fourier Transform and its Translation, Rotation, Periodicity and Symmetry properties.	**07**
	(b)	Explain Discrete Cosine Transform and its utility in image compression.	**07**
		OR	
	(b)	What is lacking in Fourier Transform that has been tried to overcome by Short Time Fourier Transform? Explain in detail.	**07**
Q.3	**(a)**	What is contrast of image? Discuss contrast stretching techniques.	**07**
	(b)	Explain intensity level slicing and bit-plane slicing.	**07**
		OR	
Q.3	**(a)**	What is histogram processing? Explain histogram equalization technique.	**07**
	(b)	What do you understand by smoothing of image? Explain mean and median filter.	**07**
Q.4	**(a)**	Describe histogram statistics for image enhancement.	**07**
	(b)	What do you understand by sharpening of image? Explain Laplacian filter for sharpening.	**07**
		OR	
Q.4	**(a)**	Explain in detail Discrete Restoration Model.	**07**
	(b)	Describe unconstraint and constrain least square restoration.	**07**
Q.5	**(a)**	Explain in brief restoration by Singular Value Decomposition (SVD).	**07**
	(b)	Explain Canny edge detector.	**07**
		OR	
Q.5	**(a)**	Explain the basics of intensity thresholding.	**07**
	(b)	Describe in brief Sobel and Prewitt edge operator.	**07**

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