Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER– I (OLD course)• EXAMINATION – SUMMER 2015

Subject Code: 710404 **Date: 15/05/2015**

Subject Name: Image Processing

Time: 10:30 am to 1:00 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)	Write a brief note on the application of digital image processing.	07
	(b)	Explain Sampling and Quantization. Why it is necessary for Image Processing?	07
Q.2	(a)	Define the Image Enhancement. Explain different Spatial domain Enhancement method.	07
	(b)	Define the basic relationships between the pixels. Also explain the different distance measures of pixels.	07
		OR	
	(b)	What is bit-plane slicing? What effect would setting to zero the lower order bit planes have on the histogram of an image in general? What would be the effect on the histogram if we set to zero the higher-order bit planes instead?	07
Q.3	(a)	How does the histogram equalization process enhance the image?	07
	(b)	What is image smoothening? Explain smoothing spatial filters.	07
		OR	
Q.3	(a)	Image averaging process reduces the noise from Image, Prove.	07
	(b)	Write the basic steps for filtering in the frequency domain. Also discuss the Algorithm complexity to calculate DFT and FFT.	07
Q.4	(a)	Explain HSI color model in brief and discuss the procedure for conversion from HSI to RGB color model.	07
	(b)	Explain global processing using the Hough transform.	07
		OR	
Q.4	(a)	What is the advantage of using Sobel operator? Explain the process of edge detection using gradient operators.	07
	(b)	Explain the concept of thresholding in image segmentation.	07
Q.5	(a)	Give a brief note on Opening and Closing Morphological operations with suitable example.	07
	(b)	Define a model of Image restoration. Also explain the different noise Probability Density functions.	07
		OR	
Q.5	(a)	Explain MPEG and also make comparison of different MPEGs.	07
	(b)	How edge detection is used for detecting discontinuities in digital image? Explain edge detection using Laplacian operator.	07