Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME SEMESTER–I EXAMINATION – WINTER 2014

Subject Code:2712308 **Date:12/01 /2015**

Subject Name: IMAGE PROCESSING

Time: 2:30 Pm to 5:30 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 different types of adjacency (connectivity) and give short mathematical description of each. Write different types of distance measures and give short mathematical description of each.	**07**
	(b)	PDFs Pr(0) to Pr(7) for given images are 0,0.2,0.2,0,0.3,0.2,0.1,0 respectively and the PDFs Pz(0) to Pz(7) for target histogram are 0,0.1,0.2,0.1,0.1,0.2,0.2,0.1 respectively. Perform histogram matching technique to achieve the target histogram and specify the probability of each level after doing this procedure.	**07**
Q.2	**(a)**	Define the term óIntensity resolutionô and óSpatial Resolutionô. Explain *false contouring*.	**07**
	(b)	Explain Smoothing of an image using suitable mask. Explain what will be the effect of mask size on resultant image.	**07**
		OR	
	(b)	Distinguish between point operations and neighborhood operations. Is multiplication by a constant factor with an image called a neighborhood process? Write your views on the resultant image obtained after multiplication by a constant factor with an image.	**07**
Q.3	**(a)**	Explain ógamma correctionô process.óγ > 1 in power law transformation is suitable for highly washed out bright appearance.ô Justify the statement.	**07**
	(b)	Write steps for filtering in the frequency domain.	**07**
		OR	
Q.3	**(a)**	What are the frequency domain filters available to sharpen the image? Discuss any one practical image sharpening filter with mathematical description.	**07**
	(b)	Explain Inverse Filter process for restoration in brief. What is a drawback of this process? What can be done to overcome this drawback?	**07**
Q.4	**(a)**	Explain HSI color model with necessary mathematical equations.	**07**
	(b)	What is pseudo color image processing? Explain intensity slicing of color image	**07**
		OR	
Q.4	**(a)**	Explain basic global thresholding algorithm.	**07**
	(b)	Explain the difference between gradient and laplacian of an image.	**07**
Q.5	**(a)**	Explain Hit or Miss Transformation of Morphological operations in detail.	**07**
	(b)	Explain Extraction of connected components approach.	**07**
		OR	
Q.5	**(a)**	Explain Spatial and Temporal Redundancy.	**07**
	(b)	Explain Image pyramids approach.	**07**

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