Seat No.: _____ *Enrolment No._____*

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – I • EXAMINATION – WINTER • 2013

Subject code: 712603N **Date: 03-01-2014**

Subject Name: Digital Image Processing and Pattern Recognition

Time: 10.30 am – 01.00 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)**	(i) Justify the necessity of Digital Image Processing.	**03**
		(ii) "Scaling is required to be done, for image addition or subtraction" Justify the statement with example.	**02**
		(iii) List the types of noise and their cause, which can corrupt an image.	**02**
	(b)	Explain in detail with example, spatial and gray level resolution.	**07**
Q.2	**(a)**	"Applications of Digital Image Processing cover entire range of Electromagnetic spectrum." Justify with suitable example.	**07**
	(b)	Explain in detail TIFF file format with merits, demerits, limitations and application.	**07**
		OR	
	(b)	Explain in detail JPEG file format with merits, demerits, limitations and application.	**07**
Q.3	**(a)**	List the major difference between histogram equalization and histogram specification. Explain with example, histogram equalization.	**07**
	(b)	Prove convolution and correlation properties of 2D-DFT.	**07**
		OR	
Q.3	**(a)**	Explain in brief: (i) Bit plane slicing (ii) Gray level slicing.	**07**
	(b)	Explain in detail about Hadamard transform and its application in image processing.	**07**
Q.4	**(a)**	Explain in brief: (i) Contra-harmonic mean filter (ii) Alpha-trimmed mean filter.	**07**
	(b)	List various color models used for color image processing and explain any one of them.	**07**
		OR	
Q.4	**(a)**	What do you mean by image compression? Explain loss-less image compression with example in detail.	**07**
	(b)	Prove that opening and closing are duals of each other.	**07**
Q.5	**(a)**	What is Hit-or-Miss transformation? Explain with example and application.	**07**
	(b)	Explain in detail use of gradient for image segmentation.	**07**
		OR	
Q.5	**(a)**	What do you mean by regional descriptors? Explain any two of them with example.	**07**
	(b)	Write short-note on machine vision.	**07**

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