Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject code: 713103N **Date: 13-06-2013**

Subject Name: Biomedical Image Processing

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)**	Explain the fundamental steps and objective of each step in digital Image processing in brief.	**07**
	(b)	Explain following terms in reference of image processing: (1) DPI (2) Piecewise wise linear transformation (3) Mach-band effect (4) Simultaneous contrast	**07**
Q.2	**(a)**	Explain image formation process in human eye.	**07**
	(b)	Write a short note on Bit plane slicing.	**07**
		OR	
	(b)	Write a short note on image processing operations based on neighborhood.	**07**
Q.3	**(a)**	Explain order statistic filter and its suitable example.	**07**
	(b)	Explain basic line detection in image with proper mathematics.	**07**
		OR	
Q.3	**(a)**	Explain geometric and harmonic mean filters with suitable example.	**07**
	(b)	Explain basic point detection in image with proper mathematics.	**07**
Q.4	**(a)**	Explain Short Time Fourier Transform (STFT) in context for image with its any three properties.	**07**
	(b)	Explain any nonlinear method for contrast stretching.	**07**
		OR	
Q.4	**(a)**	Explain Gabor transform of image in detail with suitable application.	**07**
	(b)	Explain any linear method for contrast stretching.	**07**
Q.5	**(a)**	Can we find edges in the image by integral operation? If yes then explain it, else give and explain mathematical operation for the same purpose.	**07**
	(b)	Explain in brief ñregion based segmentationò.	**07**
		OR	
Q.5	**(a)**	Can we remove/smooth edges in the image by derivative operation? If yes then explain it, else give and explain mathematical operation for the same purpose.	**07**
	(b)	Explain in brief ñthreshold selection methodsò.	**07**

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