Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER II– EXAMINATION – WINTER - 2016

Subject Code: 2723103 **Date: 18/11/ 2016**

Subject Name: Biomedical Image Processing

Time: 2:30 pm to 5:00 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 image, image processing, image analysis and image understanding.	**07**
	(b)	Enlist problems in biomedical imaging with respect to image processing. Explain any one from them in detail.	**07**
Q.2	**(a)**	Give the comparison and contrast between image processing, image analysis and image understanding.	**07**
	(b)	Explain any one real time imaging application with suitable example.	**07**
		OR	
	(b)	Explain level set edge detection method.	**07**
Q.3	**(a)**	Enlist five applications of image processing in Biomedical engineering. Illustrate any one application from them in detail	**07**
	(b)	Derive the mathematical expression for the level set edge detection method for image.	**07**
		OR	
Q.3	**(a)**	What do you understand by the term ‘Skeletonization’? Explain any one method for it in brief.	**07**
	(b)	Design an algorithm for point, line and edge detection operations on an input image. (You can write already available/designed algorithm/technique also.)	**07**
Q.4	**(a)**	Design an algorithm for segmentation of region using region growing technique. (You can write already available/designed algorithm/technique also.)	**07**
	(b)	Explain histogram matching in detail.	**07**
		OR	
Q.4	**(a)**	Design an algorithm for transforming the input image into frequency domain and then apply low pass filter for performing the smoothing operation on the input image. (You can write already available/designed algorithm/technique also.)	**07**
	(b)	Explain histogram equalization in detail.	**07**
Q.5	**(a)**	Describe the Diffusion Tensor Imaging	**07**
	(b)	Describe the functional Neuroimaging.	**07**
		OR	
Q.5	**(a)**	Write a technical note on ‘Cortical surface segmentation and flattening’.	**07**
	(b)	Write a technical note on ‘Hypothesis testing and statistical mapping’.	**07**

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