Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME SEMESTER II EXAMINATION – SUMMER 2017

Subject Code: 2723103 **Date: 26/05/2017**

Subject Name: Biomedical Image Processing

Time:02:30 PM to 05:00 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 term image, image processing, image analysis and image understanding.	**07**
	(b)	Discuss the applications of image processing with respect to biomedical imaging. Explain any one from them in detail	**07**
Q.2	**(a)**	Discuss the problems in biomedical imaging with respect to image processing. Explain any one from them in detail.	**07**
	(b)	Explain histogram equalization in detail.	**07**
		OR	
	(b)	Explain histogram matching in detail.	**07**
Q.3	**(a)**	Explain level set edge detection method.	**07**
	(b)	Design an algorithm for line detection operations on an input image. (You can write already available/designed algorithm/technique also.)	**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 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 any one real time imaging application with suitable example.	**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)	Derive the mathematical expression for the level set edge detection method for image.	**07**
Q.5	**(a)**	Describe the Cortical surface segmentation and flattening.	**07**
	(b)	Write a technical note on the Diffusion Tensor Imaging	**07**
		OR	
Q.5	**(a)**	Describe the Hypothesis testing and statistical mapping.	**07**
	(b)	Write a technical note on functional Neuroimaging.	**07**

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