Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VII(NEW) EXAMINATION – SUMMER 2019

Subject Code:2170308 **Date:14/05/2019**

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.**

			MARKS
Q.1	**(a)**	Enlist different types of Image formats. Also give full form of that.	**03**
	(b)	Enlist and explain different types of Neighbors and Connectivity with neat diagrams and appropriate mathematical expressions.	**04**
	(c)	Draw and explain block diagram of image acquisition.	**07**
Q.2	**(a)**	Enlist different types distance measurement methods between two pixels of image. explain any one with neat diagrams and appropriate mathematical expressions.	**03**
	(b)	Explain CCD & CMOS Image sensor.	**04**
	(c)	Explain the block diagram and basic steps for image filtering in frequency domain.	**07**
		OR	
	(c)	Explain HSI color model and conversion from HSI to RGB colors.	**07**
Q.3	**(a)**	Define Histogram. Draw histogram patterns of Dark and bright contrast Image.	**03**
	(b)	Explain Histogram equalization technique for image enhancement.	**04**
	(c)	Explain Opening and Closing morphological operations.	**07**
		OR	
Q.3	**(a)**	What is feature extraction? Explain importance of it in biomedical field.	**03**
	(b)	Explain bit plane slicing and importance of it with proper example.	**04**
	(c)	Explain the Dilation and Erosion morphological operations.	**07**
Q.4	**(a)**	Explain Canny edge detector.	**03**
	(b)	Write a short note on affine transformation for scaling operation.	**04**
	(c)	What is Image segmentation? Write different techniques of Image segmentation.	**07**
		OR	
Q.4	**(a)**	What is the difference between image enhancement and image restoration?	**03**
	(b)	Explain the hit-or-miss transform and its applications in image processing.	**04**
	(c)	Explain various masks which are used for Line detection image discontinuity segmentation algorithm.	**07**
Q.5	**(a)**	Explain Image Addition and Subtraction.	**03**
	(b)	Explain applications of Wavelet coding and DCT coding.	**04**
	(c)	Write short note on LZW Coding.	**07**
		OR	
Q.5	**(a)**	Explain Fundamentals of Image compression.	**03**
	(b)	Explain applications of fast Hadamard transform in image processing.	**04**
	(c)	Write a short note on K-Means Clustering.	**07**

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