Seat No.:_____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER– V• EXAMINATION – WINTER 2020

Subject Code:4659309 **Date:05/01/2020**

Subject Name:Image Processing

Time:10:30 AM to 12:30 PM **Total Marks: 56**

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			Marks
Q.1	**(a)**	Define (1) spatial resolution (2) intensity resolution (3) Euclidean distance	**03**
	(b)	Briefly explain neighbors of a pixel with example.	**04**
	(c)	Explain fundamental steps involved in digital image processing.	**07**
Q.2	**(a)**	Define Histogram. State the change in output image after histogram equalization with respect to input image.	**03**
	(b)	Give equation of laplacian. Also write mask for laplacian without considering diagonal elements and considering diagonal elements.	**04**
	(c)	Explain non linear smoothing filters in spatial domain	**07**
Q.3	**(a)**	Give difference between spatial domain and frequency domain.	**03**
	(b)	Draw and explain image degradation/restoration process model	**04**
	(c)	Explain Unsharp masking and high-boost filtering.	**07**
Q.4	**(a)**	Compare image enhancement and image restoration.	**03**
	(b)	Give name and equations of any four noise models.	**04**
	(c)	Define point processing. Explain image negatives ,log transformations and gamma transformations	**07**
Q.5	**(a)**	Briefly explain opening of an image.	**03**
	(b)	Explain hit or miss transform.	**04**
	(c)	Define Morphology. Explain Erosion and Dilation in detail	**07**
Q.6	**(a)**	Briefly explain closing of an image.	**03**
	(b)	Explain boundary extraction.	**04**
	(c)	Explain region filling with example.	**07**
Q.7	**(a)**	Compare convolution and correlation.	**03**
	(b)	Explain Image segmentation in short	**04**
	(c)	Explain Linear Hough transform in detail	**07**

Q.8	**(a)**	Write Roberts, sobel and prewitt mask.	**03**
	(b)	Explain Contra-harmonic mean filter in brief.	**04**
	(c)	Explain any one Edge linking algorithm.	**07**