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

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (old) - EXAMINATION – SUMMER 2017

Subject Code:182006 **Date:06/05/2017**

Subject Name: Machine Vision (Department Elective - II)

Time:10:30 AM to 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)**	Define histogram for a digital image. Explain that the histogram equalization process is used for image enhancement.	**7**
	(b)	Explain various parameters responsible to control the quality of image.	**7**
Q.2	**(a)**	Describe basic transfer functions used for image enhancement in digital image processing.	**7**
	(b)	Compare and contrast various methods of zooming and shrinking the digital image.	**7**

OR

	(b)	Describe image subtraction process. Give suitable examples of image subtraction process in different areas.	**7**
Q.3	**(a)**	Graphically show the following filters explaining their practical applications in digital image processing. high pass filter; low pass filter	**7**
	(b)	Explain the functioning of Median filter with suitable example for the removal of noise in the image.	**7**

OR

Q.3	**(a)**	Briefly describe the following operations to be performed on digital image with suitable examples. bit-plane-slicing; gray-level-slicing	**7**
	(b)	Give differences between working of normal median filter and adaptive median filter.	**7**
Q.4	**(a)**	Explain with suitable illustrative method the dilation process used on binary image. Give practical application of dilation process in which actual input image is a binary image.	**7**
	(b)	Briefly discuss the following logic operations based on morphology: NOT, AND, OR, XOR, NOT-AND	**7**

OR

Q.4	**(a)**	Explain the following morphological operation with suitable example and neat schematic diagram. Hit-or-Miss Transformation	**7**
	(b)	Describe the erosion process used on binary digital image with suitable illustration. Give practical application of erosion process in which actual input image is a binary image.	**7**
Q.5	**(a)**	Derive Laplacian filter in frequency domain. Bring out the concept of image enhancement using Laplacian filter.	**7**
	(b)	Explain the following distance measuring functions between pixels of digital image. 1. Euclidean distance 2. D_4 or city clock distance 3. D_8 or chessboard distance 4. D_m distance	**7**

OR

Q.5	**(a)**	Describe the working of averaging filter in spatial domain. Also explain the type of mask that can be utilized as averaging filter and procedure of scanning over digital image for image enhancement in spatial domain.	**7**
	(b)	Show that the 2-D Discrete Fourier Transform can be computed by successive computations of two 1-D Discrete Fourier Transform one after the other, one for all rows and the other for all columns.	**7**

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