Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VIII (old) - EXAMINATION – SUMMER 2018

Subject Code:182006 Date:07/05/2018

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)**	Explain the following terms briefly. Digital image, Sampling, Quantization	**07**
	(b)	With the help of suitable example describe the application of image blurring.	**07**
Q.2	**(a)**	Briefly describe the working principle of median filter, max filter and min filter.	**07**
	(b)	Explain the role of Isopreference curves to decide the quality of digital images with different amount of details.	**07**
		OR	
	(b)	Bring out the limitation of human vision system by comparing it with the working of digital camera.	**07**
Q.3	**(a)**	Explain various transfer functions which are used for the applications of image enhancement in spatial domain.	**07**
	(b)	Describe the morphological process of image dilation. Give suitable example of image enhancement using dilation process.	**07**
		OR	
Q.3	**(a)**	Explain the working principle of high pass filters and low pass filters for image enhancement in frequency domain.	**07**
	(b)	Describe the difference between opening and closing morphological operations which are performed on digital image.	**07**
Q.4	**(a)**	Define histogram of a digital image. Describe various contrast stretching operations for different types of histograms.	**07**
	(b)	Explain the following terms in relation with digital image processing. Bit plane slicing; Gray level slicing	**07**

OR

Q.4	**(a)**	Explain the working of following filters with its mathematical equation. Alpha trim filter; Contra harmonic filter	**07**
	(b)	Briefly describe the following properties of Fourier transform. Separability; Translation	**07**
Q.5	**(a)**	Differentiate between arithmetic and logical operators for digital image processing with the help of suitable examples.	**07**
	(b)	Describe and differentiate between band pass and band reject filters used in frequency domain for image restoration. Support your answer with the neat schematic diagrams of these filters.	**07**

OR

Q.5	**(a)**	Compare the working principle of general averaging filter with adaptive local noise reduction filter.	**07**
	(b)	Explain the procedure to get a sharpened image using Laplacian filter in frequency domain. Derive Laplacian filter in frequency domain to support your answer.	**07**

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