GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VIII(NEW) EXAMINATION – SUMMER 2019

Subject Code:2182006   **Date:09/05/2019**

Subject Name:Machine Vision

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.**
4. **Draw neat diagrams. Diagrams with inferior quality may not be awarded any credit.**

			MARKS
Q.1	**(a)**	Describe Match Band effect using suitable figures.	**03**
	(b)	Briefly explain the effect of 'checker board' and 'false contouring' in digital image processing.	**04**
	(c)	Define 4-adjacency, 8-adjacency and m-adjacency between pixels of digital image. Also bring out significance of these pixel relationships.	**07**
Q.2	**(a)**	Differentiate between spatial domain and frequency domain digital image processing for image enhancement.	**03**
	(b)	Give various suitable examples of image blurring to bring out its field of application.	**04**
	(c)	With the help of graphical representation explain basic transfer functions, which are commonly used in digital image processing.	**07**

OR

	(c)	Differentiate between Butter worth low pass filter and Butter worth high pass filter for image enhancement. Support your answer with suitable explanation and graphical representation of both filters.	**07**
Q.3	**(a)**	Briefly explain the working of band reject filters using graphical representation.	**03**
	(b)	With the help of suitable description and diagrams explain the utility of bit-plane-slicing in digital image processing.	**04**
	(c)	Explain with the help of graphical representation the effect of intensity of illumination on Weber ratio in digital image. Also comment on the effect of Weber ratio on brightness discrimination.	**07**

OR

Q.3	**(a)**	Bring out the concept of edge enhancement technique in spatial domain.	**03**
	(b)	What is a role of gray level sling in digital image processing? Explain with the help of suitable example and graphical representation.	**04**

(c) Briefly explain the digital image processing in which the illumination and reflectance components of image have been separated out for the purpose of image enhancement. What kind of enhancement will be observed in image? **07**

Q.4 (a) Define histogram. Draw histograms of dark, bright, poor contrast and high contrast images separately. Superimpose on these histograms the transfer functions derived from histogram equalization to stretch them. **03**

(b) Bring out the usefulness of Alpha-trimmed mean filter for noise removal from digital image. **04**

(c) Describe image subtraction process. Give suitable examples of image subtraction process in different areas. **07**

OR

Q.4 (a) Derive two dimensional Laplacian filter in frequency domain for image enhancement. What is the use of Laplacian filter in image processing application? **03**

(b) Explain the procedure to remove additive periodic noise from the digital image. **04**

(c) How does adaptive filter differ from other regular filters for noise reduction in digital image? Describe in detail the working of adaptive median filter with the help of its algorithms. **07**

Q.5 (a) What is called as 'Isopreference curve' in digital image processing? Briefly describe the characteristics of Isopreference curves for various images with different contents. **03**

(b) Discuss various methods available to bridge the gap of broken character for character recognition. **04**

(c) Briefly describe the coding redundancy and inter pixel redundancy observed in digital images. Also explain the ways to overcome them. **07**

OR

Q.5 (a) Describe in brief the concept of "Unsharp-masking" in digital image processing. **03**

(b) Describe the working principle of erosion process used on binary digital image with suitable illustration. **04**

(c) Explain the method of Huffman coding technique to compress a digital image with suitable example. **07**

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