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

Subject Code:2181102   Date:09/05/2019

Subject Name:Fundamental Of Image Processing

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.

			MARKS
Q.1	**(a)**	Define: Point processing technique. Enlist various point processing techniques used for image enhancement.	**03**
	(b)	Distinguish between spatial domain and frequency domain techniques for image enhancement.	**04**
	(c)	Draw the block diagram of components of digital image processing and explain in detail.	**07**
Q.2	**(a)**	What are the processing steps for Frequency domain filtering?	**03**
	(b)	Explain in brief: Region growing by pixel aggregation.	**04**
	(c)	What is redundancy in an image? Explain different types of redundancy in an image.	**07**
		OR	
	(c)	Derive Huffman code for encoding gray levels in image and find compression ratio.	**07**

2	3	2	1
3	3	3	2
2	3	3	2
0	3	2	1

			MARKS
Q.3	**(a)**	What is gamma correction? What is its importance?	**03**
	(b)	Compare with diagram: Intensity level slicing and Bit-plane slicing.	**04**
	(c)	Explain Pseudo-colour image processing in brief.	**07**
		OR	
Q.3	**(a)**	Explain the process of edge detection using gradient operators.	**03**
	(b)	Draw and explain the model of image degradation/restoration process.	**04**
	(c)	Explain the concept of frequency domain filtering and also write expressions of all three low pass filter and high pass filter.	**07**
Q.4	**(a)**	What is contrast stretching? What type of redundancy is removed by the arithmetic coding?	**03**
	(b)	Explain Hit-or-Miss transform in brief.	**04**
	(c)	What is histogram equalization? How does the histogram equalization process enhance the image?	**07**
		OR	
Q.4	**(a)**	State any three properties of 2-D DFT.	**03**
	(b)	How 2D discrete wavelet transform is useful for digital image processing?	**04**
	(c)	Find a transformation function that will approximately equalize its histogram, and draw the transformed image, and give the histograms of the processed image. Assume that the processed images can only take integer values between 0 and 7 (including 0 and 7).	**07**

1

0	0	1	1	3
0	1	1	3	3
1	1	2	4	5
1	2	4	5	6
2	4	5	6	7

Q.5	**(a)**	Write expressions for conversion of HSI to RGB.	**03**
	(b)	Explain JPEG Compression standard in brief.	**04**
	(c)	Explain dilation and erosion morphological operations with example.	**07**

OR

Q.5	**(a)**	Explain 2D discrete wavelet transform with help of block diagram.	**03**
	(b)	Compare: Wiener filtering and inverse filtering.	**04**
	(c)	Explain opening and closing morphological operations with example.	**07**

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