

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024****Subject Code:3164201****Date:15-05-2024****Subject Name: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.
4. Simple and non-programmable scientific calculators are allowed.

		Marks
Q.1	(a) Illustrate the concept of Binary image and gray scale image	03
	(b) Differentiate: Image Smoothing vs Image Sharpening	04
	(c) Articulate the use of components of image processing system.	07
Q.2	(a) Articulate the terms: Radiance, Luminance, Brightness	03
	(b) Write short note on Homomorphic filtering	04
	(c) Use following image to find the mean and variance.	07

1	2	3	4
5	6	7	0
0	8	7	6
5	0	0	0

What information we get given the mean and variance of the image?

OR

	(c) Summarize working of Harmonic and Contra harmonic filters.	07
Q.3	(a) In which case Min filter, Max filter and Median filters are most effective?	03
	(b) Illustrate bit plane slicing with its applications. Write down the bit planes for following 4-bit image:	04

5	3	1
2	9	8
6	7	6

	(c) Sketch the properties of Fourier transform.	07
	OR	
Q.3	(a) Explain log transformation. State its applications	03
	(b) Write a note on Adaptive Thresholding.	04
	(c) What is pseudo color image processing? Explain intensity slicing of color image.	07

Q.4	(a) State and explain principal approaches for segmentation	03
	(b) Illustrate HSI color model with all essential figure and equation.	04
	(c) Describe in detail: Adaptive, Local Noise Reduction Filter	07

OR

Q.4	(a) Articulate concept of Haar Transform and mention its applications.	03
	(b) Summarize Sobel's edge detectors	04

	(c)	Sketch different noise models in image.	07
Q.5	(a)	What is mean and variance of the data? Explain with proper equation.	03
	(b)	Write a note on Gaussian filter	04
	(c)	Write short note on LZW Coding ?	07
OR			
Q.5	(a)	Contrast: Lossless and lossy compression	03
	(b)	Explain DFT and DCT with their applications in image processing.	04
	(c)	Explain spatial correlation and convolution with suitable example.	07