

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE – SEMESTER- VII EXAMINATION-SUMMER 2023

Subject Code: 2170712

Date: 21/06/2023

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) What is a digital image? What are the various types of images?	03
	(b) Explain the image formation model?	04
	(c) Explain different applications of Image Processing?	07
Q.2	(a) Explain grey level transformation in brief	03
	(b) Explain the following edge extraction operators i. Sobel ii. Prewitt iii. Roberts iv. Laplacian v. Fri-chen	04
	(c) Explain bit plane slicing and contrast stretching	07
	OR	
	(c) Explain smoothing spatial filters?	07
Q.3	(a) Explain Image restoration Model?	03
	(b) Explain DFT with their applications in image processing field.	04
	(c) Write steps for filtering of image in frequency domain. Also explain ringing effect and Gaussian Lowpass Filter.	07
	OR	
Q.3	(a) Explain mean and median filtering with example?	03
	(b) Write short note on (i) Averaging filter (ii) Weighted Averaging filter	04
	(c) Explain spatial correlation and convolution with suitable example. Write all conclusions.	07
Q.4	(a) Explain salt and pepper noise?How salt and pepper noise can be removed with different types of filter?	03
	(b) Explain HSV Model	04
	(c) Explain Bitplane coding with example	07
	OR	
Q.4	(a) Explain Haar Transform and mention its applications.	03
	(b) Explain the morphological operations dilation and erosion	04
	(c) Explain LZW coding with example	07
Q.5	(a) Discuss Spatial and Temporal Redundancy of an Image.	03
	(b) Explain fidelity criteria in Image Compression ?	04
	(c) Explain Huffman Encoding with example?	07
	OR	
Q.5	(a) Explain Hough Transform.	03
	(b) What is edge? Explain the types of discontinuities in image.	04
	(c) Explain Image segmentation and its various applications	07