

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3164201****Date:04-07-2023****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) Explain Electromagnetic spectrum in details	03
(b) Discuss relationship between pixels with Neighbors of a pixel.	04
(c) Explain fundamental steps in digital image processing with proper diagram.	07
Q.2 (a) List out any three gray-level transformation functions with expression.	03
(b) Define histogram of an Image and explain its applications.	04
(c) Explain image smoothing using spatial Filters.	07
OR	
(c) Explain image sharpening using spatial Filters.	07
Q.3 (a) Explain Ideal Lowpass Filter for smoothing image in Frequency Domain.	03
(b) Explain Gaussian Highpass Filter for sharpening image in Frequency Domain.	04
(c) Describe image restoration process with block diagram and explain noise models.	07
OR	
Q.3 (a) Explain Gaussian Lowpass Filter for smoothing image in Frequency Domain.	03
(b) Explain Homomorphic Filtering.	04
(c) Explain Order statistic filters and Adaptive filters for image restoration in spatial domain.	07
Q.4 (a) Differentiate: Image enhancement vs. Image Restoration	03
(b) Discuss inverse filtering in brief.	04
(c) Define Image Compression. Explain Image Compression Model.	07
OR	
Q.4 (a) Explain Bandpass Filters for periodic noise reduction.	03
(b) Explain Mean filters for image restoration in spatial domain.	04
(c) List out color models. Explain RGB and HIS color model in brief.	07
Q.5 (a) Explain multiresolution expansion using wavelet function.	03
(b) Discuss Haar transform in detail.	04
(c) Discuss Basic Global Thresholding and Basic Adaptive Thresholding method for image segmentation.	07
OR	
Q.5 (a) Explain Hough Transform in Edge Linking and Boundary Detection.	03
(b) Show various line detection masks and its usage.	04
(c) Describe image pyramid technique.	07
