

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3161604****Date:12-07-2023****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) Define digital image. List out various applications of image processing.	03
	(b) Discuss relationship between pixels with Neighbors of a pixel.	04
	(c) Explain fundamental steps and objective of each step in digital image processing with proper diagram.	07
Q.2	(a) Differentiate: Image enhancement vs. Image Restoration	03
	(b) Explain Mean filters for image restoration in spatial domain.	04
	(c) Define Histogram. Explain histogram equalization with example.	07
OR		
	(c) Explain basic gray level transformations.	07
Q.3	(a) Describe Histogram matching process in detail.	03
	(b) Differentiate: Low pass filter vs. High pass filter	04
	(c) Explain Ideal Highpass Filters and Gaussian Highpass Filters for sharpening image in Frequency Domain.	07
OR		
Q.3	(a) Explain Gaussian Lowpass Filter for smoothing image in Frequency Domain.	03
	(b) Explain Butterworth Lowpass Filters for smoothing image in Frequency Domain	04
	(c) Derive the laplacian operator for image sharpening in spatial domain and show its usage.	07
Q.4	(a) Explain RGB color model in brief.	03
	(b) Differentiate: lossy image compression vs lossless image compression.	04
	(c) Describe image restoration process with block diagram and explain noise models.	07
OR		
Q.4	(a) Discuss LZW error-free compression in brief.	03
	(b) List out color models. Explain HIS color model in brief.	04
	(c) Explain order statistic filters for image restoration in spatial domain.	07
Q.5	(a) Define image segmentation. List out application of image Segmentation.	03
	(b) Show various line detection masks and its usage.	04
	(c) Describe image pyramid technique.	07
OR		
Q.5	(a) Explain multiresolution expansion using wavelet function.	03
	(b) Discuss Haar transform in detail.	04
	(c) Discuss thresholding method for image segmentation.	07