

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER- VI EXAMINATION – SUMMER 2026

Subject Code:3164201

Date:08-06-2026

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.	03
(b) Define digital image. List out various applications of image processing.	04
(c) Explain fundamental steps in digital image processing with proper diagram.	07
Q.2 (a) Differentiate: Image enhancement vs. Image Restoration.	03
(b) Define histogram of an Image and explain its applications.	04
(c) Explain image smoothing using spatial Filters.	07
OR	
(c) Explain basic gray level transformations.	07
Q.3 (a) Explain Image restoration Model.	03
(b) Differentiate: Low pass filter vs. High pass filter.	04
(c) Explain spatial correlation and convolution with suitable example.	07
OR	
Q.3 (a) Describe Histogram matching process in detail.	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
Q.4 (a) Explain RGB colour model in brief.	03
(b) Explain Colour Slicing and Colour Complements in Colour transformation	04
(c) List out the applications of each colour model. Explain any one colour model in brief.	07
OR	
Q.4 (a) Discuss LZW error-free compression in brief	03
(b) Differentiate: lossy image compression vs lossless image compression.	04
(c) Describe image pyramid technique.	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) Discuss Basic Global Thresholding and Basic Adaptive Thresholding method for image segmentation. **07**

OR

- Q.5** (a) Explain multi resolution expansion using wavelet function. **03**
- (b) Discuss Haar transform in detail. **04**
- (c) Explain order statistic filters for image restoration in spatial domain. **07**