

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII(NEW) EXAMINATION – SUMMER 2019****Subject Code:2170712****Date:27/05/2019****Subject Name:Image Processing****Time:02:30 PM TO 05:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1**
- (a) How to calculate distance between pixels. Discuss Neighbors of a pixel. **03**
- (b) List out different types of file formats available to represent an image. **04**
- (c) Explain fundamental steps and objective of each step in digital image processing with proper diagram. **07**
- Q.2**
- (a) Discuss process of spatial filtering and discuss its applications. **03**
- (b) Differentiate Image Processing and Computer Vision. **04**
- (c) Explain two dimension cosine transform. **07**
- OR**
- (c) Derive the laplacian operator for image sharpening in spatial domain and show its usage. **07**
- Q.3**
- (a) Explain smoothing using frequency-domain filters. **03**
- (b) Briefly explain sampling and quantization. **04**
- (c) Describe image pyramid technique. **07**
- OR**
- Q.3**
- (a) Discuss Basic Global Thresholding and Basic Adaptive Thresholding. **03**
- (b) Discuss Haar transform in detail. **04**
- (c) Define Image Compression. Explain Image Compression Model. **07**
- Q.4**
- (a) List applications of RGB, HIS and CMYK color Models. **03**
- (b) Discuss Spatial and Temporal Redundancy of an Image. **04**
- (c) Explain histogram equalization with example. **07**
- OR**
- Q.4**
- (a) Write the $M \times N$ digital image in compact matrix form? **03**
- (b) What is image segmentation? Write applications of image segmentation. **04**
- (c) Discuss in detail, basic edge detection techniques. **07**
- Q.5**
- (a) What is meant by Tapered Quantization? **03**
- (b) Write the expression of one-dimensional discrete Fourier transforms. **04**
- (c) Define image compression. Explain Image Compression Model. **07**
- OR**
- Q.5**
- (a) What are the Properties of Slant transform? **03**
- (b) What is meant by masking? Explain with Example. **04**
- (c) Compare Fourier and wavelet transform. Mention applications of wavelet. Explain image pyramid in detail. **07**
