Seat No.:	Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY ME SEMESTER – I (NEW) EXAMINATION – SUMMER 2017

Subject Code: 2712308 Date:11/05/2017 **Subject Name: Image Processing** Time: 02:30 P.M. to 05:00 P.M. **Total Marks: 70 Instructions:** 1. Attempt all questions. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. Explain Components of Digital Image Processing. **Q.1** 07 Explain the following processes of image enhancement in spatial domain; 07 i. Contrast stretching. ii. Grev level slicing iii. Bit plane Explain Hit or Miss Transformation of Morphological operations in detail. 07 0.2 Explain HSI color model with necessary mathematical equations. **(b)** 07 Explain RGB color model with necessary mathematical equations. **07 Q.3** What is Histogram? Explain in detail process of Histogram Equalization. 07 (a) Discuss steps of image filtering in frequency domain. Discuss 2D discrete Fourier 07 **(b)** transform with help of equations. Q.3 (a) Explain the process of Image sharpening. **07** Explain basic global thresholding algorithm 07 **(b) Q.4** What is the difference between degradation and noise? Explain image degradation 07 and restoration model. Explain basic concepts of image sampling and quantization. Discuss spatial and gray 07 **(b)** level resolutions. **07** 0.4 (a) Write a short note on Huffman Coding with appropriate example. Explain basic principle of homomorphic filtering. Draw and explain implementation 07 **(b)** block diagram of homomorphic filtering Explain term: Image Pyramid 0.5 07 (a) Explain dilation and erosion morphological operations **07 (b) Explain Lossless Compression Methods** 07 **Q.5** (a) Define Low Pass filter in frequency domain. Differentiate between Butterworth Low **(b)** 07 pass and Gaussian low pass filter.
