Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

ME – SEMESTER I (NEW) – • EXAMINATION – SUMMER 2016

Subject Code: 2712308 **Date:19/05/2016**

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)** Explain Sampling and quantization with example. Discuss spatial and intensity resolution. **07**

(b) Describe different point processing techniques used for Image Transformation. **07**

Q.2 **(a)** Define histogram. Plot histogram of following image and equalize. **07**

r_k	0	1	2	3	4	5	6	7
n_k	790	1023	850	656	329	245	122	81

Where r_k is intensity value and n_k is number of pixels.

(b) Discuss the different types of Color models in brief. **07**

OR

(b) Briefly explain Wiener and Inverse filtering. **07**

Q.3 **(a)** Explain noise. How you can classify noise. Describe various noise models. **07**

(b) Briefly explain model of the image restoration. Explain representation of restoration in spatial domain and frequency domain. **07**

OR

Q.3 **(a)** Explain (1) Homomorphic filter and (2) Gaussian high pass filter in frequency domain. **07**

(b) Explain sobel operator? Explain the process of edge detection using gradient operator. **07**

Q.4 **(a)** Write a note on Image pyramid and Subband coding. Describe discrete Wavelet Transform. **07**

(b) Briefly explain Pseudocolor Image processing techniques. **07**

OR

Q.4 **(a)** Give notes on Morphological operations on binary image. **07**

(b) Explain High-boost filtering and Unsharp masking. **07**

Q.5 **(a)** Write short note on Dilation and Erosion for morphological operation. **07**

(b) Explain Image Sensing and Acquisition. How illumination energy is transformed into the digital image with different sensors? **07**

OR

Q.5 **(a)** Explain methods for lossy image compression technique. Discuss any one of them. **07**

(b) How to measure a distance between pixels? Explain Adjacency, Connectivity, Regions, Boundaries and Neighbors of a pixel in brief. **07**

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