Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

M. E. - SEMESTER – II • EXAMINATION – SUMMER • 2014

Subject code: 1720104 **Date: 20-06-2014**

Subject Name: Digital Image Processing

Time: 02:30 pm - 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 types of adjacency with example **07**

(b) Define wavelet. Explain Image Pyramid in detail. **07**

Q.2 **(a)** Describe the process of convolution and correlation with example. **07**

(b) Describe steps for filtering in the frequency domain. Explain sharpening frequency domain filters in detail **07**

OR

(b) Equalize the given histogram **07**

Grey	0	1	2	3	4	5	6	7
No. of pixels	790	1023	850	656	329	245	122	81

Q.3 **(a)** What effect would set to zero the higher order bit planes have on the histogram of an image in general? **07**

0	1	2	3
4	5	6	7
8	9	10	11
12	13	14	15

(b) Explain noise. How you can classify noise. Describe various noise models. **07**

OR

Q.3 **(a)** Explain Segmentation using HIS and RGB Model. Which would yield better results? **07**

(b) Explain image enhancement by point processing. **07**

Q.4 **(a)** Explain lossy image compression technique and discuss any one of them. **07**

(b) Explain Haar transform and subband coding in detail **07**

OR

Q.4 **(a)** Explain region extraction in detail. **07**

(b) Compare between contrast stretching and histogram equalization. **07**

Q.5 **(a)** Develop a procedure for computing the median in n*n neighborhood. State and explain the features of median filtering. **07**

(b) Explain Robert ,Prewitt and Sobel Operator in detail **07**

OR

Q.5 **(a)** Explain erosion, dilation and prove duality theorm. **07**

(b) Given a 7 x 7 image, make use of the Hit or Miss transform to find the top edge of the 5 x 5 square. **07**

0	0	0	0	0	0	0
0	1	1	1	1	1	0
0	1	1	1	1	1	0
0	1	1	1	1	1	0
0	1	1	1	1	1	0
0	1	1	1	1	1	0
0	0	0	0	0	0	0

Use the two structuring elements (B1 AND B2) as shown below:

0	0	0
0	1	0
0	1	0

0	1	0
0	0	0
0	0	0

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