Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code: 2720208 **Date: 27/05/2016**

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.**

Q.1 **(a)** What is the importance of digitizer in DIP? Explain the significance of sampling and quantization in DIP. **07**

(b) Compare and contrast average filtering and median filtering and also show mask operation involving on 3 * 3 for median and average filtering. **07**

Q.2 **(a)** What is the importance of color in image processing? Mention important quantities of color and also explain Hardware oriented color model. **07**

(b) Give difference between image enhancement and image restoration process. Explain block diagram of the model of the image degradation/restoration process in detail. **07**

OR

(b) Explain dynamic range compression log transformation and power-law transformation with example. **07**

Q.3 **(a)** Suppose we have a dark image which needs to be compressed and also equalized. Which operation would we use first? Will the result be the same if the order of operations is reserved? **07**

(b) Explain smoothing and sharpening frequency domain filters. **07**

OR

Q.3 **(a)** What is the use of histogram equalization? Explain with given example. **07**

Grey	0	1	2	3	4	5	6	7
No. of Pixels	500	700	0	630	0	630	0	100

(b) Explain different Gradient operators in detail. **07**

Q.4 **(a)** Explain morphological close operation for the following image and also mention observation of this image. **07**

a. Image

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

b. Structuring element

1	1
1	1

(b) How color image segmentation is working on RGB color space. Explain working of gradient operator for edge detection in RGB color space. **07**

OR

Q.4 **(a)** Apply region filling algorithm for the below image. **07**

a. Image b. structuring element.

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

0	1	0
1	1	1
0	1	0

(b) Explain polygonal fit algorithm in detail. **07**

Q.5 **(a)** Explain Haar wavelet in detail. **07**

(b) Explain various functional block of JPEG standard in detail. **07**

OR

Q.5 **(a)** Explain arithmetic coding and Huffman coding. **07**

(b) Explain various noise model and how it can be defined? **07**

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