

**GUJARAT TECHNOLOGICAL UNIVERSITY****M. E. I<sup>ST</sup> Semester–Remedial Examination – July- 2011****Subject code: 712603N****Subject Name: Digital Image Processing and Pattern Recognition****Date:11/07/2011****Time: 10:30 am – 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)** Answer the following. **07**
- (1) What is histogram equalization? When it can be used?
  - (2) Differentiate between gray level slicing and bit-plane slicing.
  - (3) What is gamma correction? Where it is required?
- (b)** Explain in detail the use of Digital Image Processing in various fields. **07**
- Q.2 (a)** Explain in detail about sampling and quantization processes to create digital image. **07**
- (b)** Prove that second pass of histogram equalization produces the same result. **07**
- OR**
- (b)** Explain the term false contouring and checkerboard effect. How we can reduce the same? **07**
- Q.3 (a)** Prove that  $F(f(x) * g(x)) = F(x)G(x)$  i.e. convolution in spatial domain is same as multiplication in frequency domain. **07**
- (b)** Briefly explain the model of image degradation process. Also give the equations for both spatial and frequency domain **07**
- OR**
- Q.3 (a)** Prove that image averaging is useful to remove zero mean noise. **07**
- (b)** Compare Ideal, Butterworth and Gaussian low pass frequency domain filters with respect to image. **07**
- Q.4 (a)** Explain different color models used for color image processing. **07**
- (b)** Explain with merits and demerits of the BMP and TIFF image file format. **07**
- OR**
- Q.4 (a)** Briefly explain lossless and lossy compression techniques with an example. **07**
- (b)** Write short note on wavelet transform. **07**
- Q.5 (a)** Explain the gray scale morphological operation with examples. **07**
- (b)** Discuss the boundary extraction algorithm with an example. **07**
- OR**
- Q.5 (a)** Discuss the skeleton algorithm with an example. **07**
- (b)** What do you mean by regional descriptors? Explain any one of them with an example. **07**

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