# GUJARAT TECHNOLOGICAL UNIVERSITY
### M. E. I$^{ST}$ Semester–Remedial Examination – July- 2011
### Subject code: 710404
### Subject Name: Image Processing

Date:13/07/2011                                      Time: 10:30 am – 01:00 pm
                                                     Total Marks: 60

## Instructions:
   1. **Attempt all questions.**
   2. **Make suitable assumptions wherever necessary.**
   3. **Figures to the right indicate full marks.**

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|---|---|---|---|
| **Q.1** | **(a)** | Write a brief note on Fundamental steps in Digital Image Processing with necessary diagram. | **06** |
| | **(b)** | Explain Sampling and Quantization. Why it is necessary for Image Processing? | **06** |
| **Q.2** | **(a)** | Explain all methods of Piecewise – Linear Transformation for Image Enhancement Compare it with basic Gray Level Transformation for Image Enhancement technique. | **06** |
| | **(b)** | Define Histogram processing. Derive necessary equations for Histogram Equalization. | **06** |
| | | **OR** | |
| | **(b)** | Explain the procedure for Histogram Matching with necessary equations. | **06** |
| **Q.3** | **(a)** | Explain basic Steps of filtering in the frequency domain with block diagram. | **06** |
| | **(b)** | Derive various gradient operators. Explain the process of edge detection using Gradient operators. What is the purpose of Laplacian operator? | **06** |
| | | **OR** | |
| **Q.3** | **(a)** | Discuss any one filter method for smoothing and sharpening in Frequency Domain. What is the difference between ILPF and Butterworth Low pass filter? | **06** |
| | **(b)** | Discuss Haar Transform and FFT | **06** |
| **Q.4** | **(a)** | Discuss Hit–or–Miss Transformation. | **06** |
| | **(b)** | Explain Inverse Filtering for Image Restoration. | **06** |
| | | **OR** | |
| **Q.4** | **(a)** | Discuss Morphological opening and closing. | **06** |
| | **(b)** | Write a short note on Wiener Filtering | **06** |
| **Q.5** | **(a)** | Write a short note on JPEG 2000 | **06** |
| | **(b)** | Define Thresholding. Discuss Basic Global Thresholding and Basic Adaptive Thresholding. | **06** |
| | | **OR** | |
| **Q.5** | **(a)** | Explain MPEG and also make comparison of different MPEGs. | **06** |
| | **(b)** | Write a short note on Hough Transform | **06** |

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