## GUJARAT TECHNOLOGICAL UNIVERSITY M. E. - SEMESTER – I • EXAMINATION – WINTER 2012

| Subject code: 710404NDate: 10-01-2013Subject Name: Image Processing<br>Time: 02.30 pm - 05.00 pmTotal Marks: 70Instructions:1. Attempt all questions.1. Attempt all questions.2. Make suitable assumptions wherever necessary.3. Figures to the right indicate full marks. |            |   |          |
|--|------------|---|----------|
| Q.1  |            | Define the Image Enhancement. Explain different Spatial domain<br>Enhancement method.<br>Apply $3*3$ Average Filter on image x given below.<br>X = 25 40 50 80<br>30 22 60 70<br>42 60 52 51<br>28 27 31 45 | 07<br>07 |
| Q.2  | (a)<br>(b) | Explain the edge detection using gradient operators.<br>Describe different point processing techniques used for Image<br>Transformation<br><b>OR</b>  | 07<br>07 |
|  | <b>(b)</b> | Compare Laplacian and Gradient methods for Image Sharpening.  | 07       |
| Q.3  | (a)<br>(b) | Write the basic steps for filtering in the frequency domain. Also discuss<br>the Algorithm complexity to calculate DFT and FFT.<br>What is the Image Restoration? Explain Inverse Filtering Method.         | 07<br>07 |
| Q.3  | (a)<br>(b) | <b>OR</b><br>Discuss the different types of Color models in brief.<br>Explain different Low Pass and High Pass filtering in the Frequency<br>Domain.  | 07<br>07 |
| Q.4  | . ,        | Define the Histogram of an Image? Explain the Equalization of Histogram.<br>Discuss the application of Digital Image Processing.  | 07<br>07 |
|  | (0)        | OR  | 07       |
| Q.4  | (a)<br>(b) | Describe DCT and DWT in brief.<br>Illustrate the Process of the Edge detection. Write the steps of Canny<br>Edge Detector.  | 07<br>07 |
| Q.5  | (a)        | Give a brief note on Opening and Closing Morphological operations with suitable example.  | 07       |
|  | <b>(b)</b> | Explain the JPEG 2000 Standard.   | 07       |
| Q.5  | (a)<br>(b) | <b>OR</b><br>Write a note on Component of Digital Image Processing.<br>Explain the H.26x standard.  | 07<br>07 |

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