(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 2934   Roll No. [   ]

B.Tech.

(SEM. VIII) THEORY EXAMINATION 2011-12

DIGITAL IMAGE PROCESSING

Time : 3 Hours   *Total Marks : 100*

Note :—Attempt all questions.

1. Attempt any **four** parts of the following :—   (5×4=20)

   (a) What is digital image processing ? List the applications of digital image processing.

   (b) What is digital image representation ? How a digital image can be represented using matrices ?

   (c) Describe various components of an image processing system.

   (d) Differentiate between binary images and indexed images.

   (e) What is histogram equalization ? Explain briefly.

   (f) What is spatial filtering ? Explain linear spatial filtering technique.

2. Attempt any **two** parts of the following :—   (10×2=20)

   (a) Describe the basic steps involved in Discrete Fourier Transform (DFT) filtering.

   (b) Explain the working of a lowpass frequency domain filters.

(c) Explain the following terms :

    (i) Arithmetic mean filters

    (ii) Geometrical mean filters.

3. Attempt any **two** parts of the following :— **(10×2=20)**

    (a) What is the color image processing ? Explain the color transformations in detail.

    (b) Explain following in detail :

        (i) Color image smoothing

        (ii) Color image sharpening.

    (c) Describe dilation and erosion operations of image processing.

4. Attempt any **two** parts of the following :— **(10×2=20)**

    (a) Describe the Laplacian of a Gaussian technique used to detect edges from a digital image.

    (b) What is image thresholding ? How does image thresholding play a central role in applications of image segmentation ?

    (c) Explain Harris-Stephen's corner detection technique.

5. Write short notes on any **four** of the following :—

                                      (5×4=20)

    (a) Feature extraction techniques

    (b) Classification techniques

    (c) Linear Descriptor Analysis

    (d) Boundary-based descriptor

    (e) Clustering techniques

    (f) Graph matching.