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(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.

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(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.