DIGITAL IMAGE PROCESSING

Time : 3 Hours  Total Marks : 100

Note :- Attempt all questions.

1. Attempt any four parts of the following :-  (5x4=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 :-  (10x2=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.