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

PAPER ID : 2934 Roll No. | | | | | | | | | | |

B.Tech.

(SEM. VIII) EVEN THEORY EXAMINATION 2012-13

DIGITAL IMAGE PROCESSING

Time : 3 Hours *Total Marks : 100*

Note :– Attempt **all** questions. All questions carry equal marks.

1. Attempt any **four** parts of the following : **(5×4=20)**
   (a) What do you mean by digital image representation ?
   (b) Compare and contrast between linear spatial filtering and nonlinear spatial filtering.
   (c) Describe various components of an image processing system.
   (d) Describe the basic steps involved in Discrete Fourier Transform (DFT) filtering.
   (e) Explain the process of lowpass frequency domain filters in image enhancement.
   (f) Describe the working of Gaussian highpass filter by taking a suitable example.
2. Attempt any **two** parts of the following : **(10×2=20)**
   (a) What do you mean by image subtraction and image averaging operations ? Why we need image subtraction and image averaging operations in image processing ?
   (b) Explain Laplacian filter.

(c) What is histogram equalization ? Explain briefly.

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

(a) What do you mean by image restoration ? Describe image restoration process by a model of image degradation and subsequently image restoration.

(b) Describe the principle of mean filter in image processing. Differentiate between arithmetic mean filter and geometric mean filter.

(c) How the noise parameters are estimated in spatial domain ?

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

(a) Describe the fundamental operations of morphological image processing.

(b) Explain opening and closing operations for gray-scale image processing.

(c) Explain the following algorithms in detail :

(i) Boundary extraction

(ii) Region filling.

5. Write short notes on any **four** of the following : **(5×4=20)**

(a) Image registration

(b) Region extraction

(c) Edge detection algorithm

(d) Line detection algorithm

(e) Image thresholding

(f) Image interpolation.