

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

PAPER ID : 2934

Roll No.

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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.