

## B. TECH.

**THEORY EXAMINATION (SEM-VIII) 2016-17**  
**DIGITAL IMAGE PROCESSING**

Time : 3 Hours

Max. Marks : 100

Note : Be precise in your answer. In case of numerical problem assume data wherever not provided.

## SECTION – A

1. Attempt all parts of the following questions: 10 x 2 = 20

- (a) Define Image. What is Dynamic range?
- (b) What is meant by illumination and reflectance?
- (c) Find the number of bits required to store a 256 X 256 image with 32 gray levels?
- (d) Explain the type of connectivity.
- (e) What is contrast stretching?
- (f) What do you mean by dilation and erosion?
- (g) Explain Noise model.
- (h) List edge detection operators.
- (i) Explain Affine transform.
- (j) Explain the concept of thresholding.

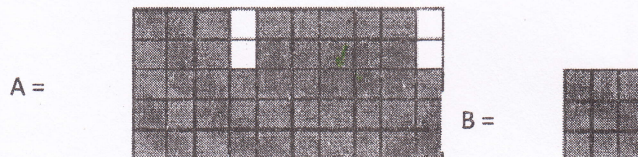
## SECTION – B

2. Attempt any five parts of the following questions: 5 x 10 = 50

- (a) What is digital image processing? Draw a block diagram. And discuss some of its major applications.
- (b) Write a short note on
  - (i) Sampling and Quantization
  - (ii) Homomorphic filtering
- (c) Explain Histogram equalization. And equalize the given histogram.

Grey level	0	1	2	3	4	5	6	7
Number of Pixel	790	1023	850	656	329	245	122	81

- (d) Define boundary extraction? Perform boundary extraction on image A with the help of structuring element B



- (e) What is Noise? Define any two noise models in detail.
- (f) What is Geometric transformation? Also discuss Euclidean Transformation.
- (g) How dilation and erosion is used in Morphological operations. How it is used in opening and closing operations.
- (h) Write a short note on
  - (i) Image Segmentation
  - (ii) Sampling and quantization
  - (iii) Illumination and reflectance

## SECTION – C

Attempt any two parts of the following questions: 2 x 15 = 30

- 3 What are the different stages of digital image processing? Explain each stage in detail.
- 4 Explain the following in details
  - (i) Stereo Imaging
  - (ii) Region filling
  - (iii) Convex Hull
- 5 What is image restoration? Draw and explain the basic block diagram of the restoration process. Give two areas where restoration process can be applied?