Printed Pages : 1 **Roll No.** | | | | | | | | | | | **EIT081**

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. Explain the following: **10 x 2 = 20**

(a) What is Mean Square Error Restoration?

(b) What do you mean by Dilation?

(c) What is Mathematical Morphology?

(d) What are Opening operations?

(e) What are Closing operations?

(f) What do you understand by Thinning?

(g) What do you understand by Thickening?

(h) What do you mean by Erosion?

(i) Explain about various Degradation functions.

(j) What is meant by Structuring elements?

SECTION – B

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

(a) What do you understand by Band-Pass Filter?

(b) Draw and Explain Degradation model in detail.

(c) Compute the histogram h[k] and cumulative histogram H[k] of a one dimension image f[x] below.

f[x]	1	3	2	5	3	4	3	3	3	2
x	0	1	2	3	4	5	6	7	8	9

(i) Tabulate h[k] and H[k].

(ii) Plot h[k] and H[k].

(d) What is Edge & Line detection?

(e) Explain Noise Model in detail.

(f) Consider the following figure where each small rectangle represents a pixel and the value inside it is gray level at the pixel. Hence the whole array represents a digital image f(x,y) of size 5*5. The centre pixel f(2,2) is marked by underline. Applying the following 3*3 smoothing filters on this pixel.

(i) Mean Filter (ii) Minimum

(iii) Maximum (iv) Median

(v) Weighted filter given by following 3*3 masks

1	2	0
4	2	5
2	6	4

(g) What do you understand by Band-Pass Filter?

(h) Draw the block diagram of Restoration process & Explain each block.

SECTION – C

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

3 What do you understand by Hit-Miss Transform and why they are used explain in brief?

4 Explain the Periodic Noise Reduction by Frequency Domain filtering.

5 What do you mean by various Arithmetic and Logical operations on image?