Printed Pages: 02 **Sub Code: NCS 801**

Paper Id: | 1 | 1 | 0 | 8 | 1 | 1 | **Roll No.** | | | | | | | | | | |

B TECH

(SEM-VIII) THEORY EXAMINATION 2017-18

DIGITAL IMAGE PROCESSING

Time: 3 Hours ***Total Marks: 100***

Note: 1. Attempt all Sections. If require any missing data; then choose suitably.

SECTION A

1. Attempt *all* questions in brief. **2 x 10 = 20**

(a) Define Image. What is range?
(b) What is meant by reflectance?
(c) What is meant by binary image, color image, grey-scale image?
(d) Explain Harmonic mean filter.
(e) What is contrast stretching?
(f) What do you mean by dilation and erosion?
(g) Explain counter predictive coding.
(h) List edge detection operators.
(i) Explain affine transform.
(j) Explain the concept of thresholding.

SECTION B

2. Attempt any *three* of the following: **10 x 3 = 30**

a). What do you mean by digital image representation.

b). Compare and contrast between linear spatial filtering and non linear spatial filtering.

c). What is image restoration? Draw and explain the basic block diagram of the restoration process. Give two areas where restoration process can be applied?

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

e). Prove that prewitt and sobel operator act as a low pass and high pass filter.

SECTION C

3. Attempt any *one* part of the following: **10 x 1 = 10**

a). Explain region based segmentation with an example.

b). Explain intensity transformations in details. What would happen to the dynamic range of an image if all the slopes in the contrast stretched algorithm (l, m, n) are less than 1? Answer using illustration.

4. Attempt any *one* part of the following: **10 x 1 = 10**

a). Explain intensity transformations in details. What would happen to the dynamic range of an image if all the slopes in the contrast stretched algorithm (l, m, n) are less than 1? Answer using illustration.

b). Explain the Hough Transforms to join the points. And also explain the problem of HT with their solutions. Given the four points in the x-y plane with the following coordinates (1,1), (2,2),(3,3), (4,4). Use Hough Transform to join these points.

5. Attempt any *one* part of the following: 10 x 1 = 10

a). What is Histogram Equalization ?

b). Explain Laplacian Filter.

6. Attempt any *one* part of the following: 10 x 1 = 10

a). Explain opening and closingoperation for gra scale image processing.
b). describe fundamental operations of morphological image processing.

7. Attempt any *one* part of the following: 10 x 1 = 10

a). Write short note on following
i- Region Extraction ii-Image Registration
b). Write short note on following
i- Edge detection Algorithm ii- Line detection Algorithm

CORRECTION IN NCS 801 23-05-2018 EVENING SHIFT

DIGITAL IMAGE PROCESSING

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SECTION C

3. b). Explain smoothing and sharpening in detail and the filters involved in it.