Printed pages: 02 **Sub Code: ECS702**

Paper Id: 1 0 3 0 **Roll No.** | | | | | | | | | | |

B TECH
(SEM VII) 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 x10 = 20

a. Describe Quantization in short.
b. Write various gray level slicing techniques.
c. Write thresholding method of segmentation in short.
d. What is convex HUQ?
e. What is Digital Image Processing? Describe in short.
f. What is Gamma Correction?
g. Explain the properties of Images, which can be described by histogram.
h. What is histogram matching?
i. What is SNR? Describe in short.
j. Describe Median filtering.

SECTION B

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

a. Explain the 4-8 and m connectivity of pixels. Explain region, edge in context with connectivity of pixels.
b. Discuss image smoothing with low pass spatial filtering.
c. Find the equivalent filter, H (u,v) that implements in the frequency domain. The spatial operation performed by the Laplacian
d. Explain image Degradation/Restoring Process. Explain all noises with their PDF.
e. Distinguish between spatial domain techniques and frequency domain techniques of image enhancements.

SECTION C

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

(a) How many degrees of freedom are there in Plane Projective Transformation? Name the properties preserved under such transformation. Explain projective and affine transformation.
(b) Discuss various edge detectors in detail. What is image registration? Explain stereo imaging in detail.

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

(a) Explain the following Morphological Algorithms
(i) Thining
(ii) Thicking
(iii)Convex Hull
(iv)Extraction of connected components
(b) (i) Prove that Opening & Closing are dual transformations.
(ii) Explain the procedure of Region Filling with an example.

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

(a) Brief explain the working of Laplacian mask. What will be the effect of applying the filter (a) on the image (b)

1	1	1
1	-8	1
1	1	1

(a)

50	50	50	50	50	50
50	50	50	50	50	50
50	50	50	50	50	50
100	100	100	100	100	100
100	100	100	100	100	100
100	100	100	100	100	100

(b)

(b) (i) What is Bit-Plane slicing? Given the following 3X3 image find its Bit Planes

1	2	3
4	5	0
7	2	1

(ii) Describe Piece-wise linear transformations.

6. Attempt any *two* parts of the following: 5 x 2 = 10

(a) Fins the DFT of f(x) = {0, 1, 2,1 }

(b) Given h(u,v) as follows, discuss its frequency response.

	$\frac{1}{6}$	
$\frac{1}{6}$	$\frac{1}{3}$	$\frac{1}{6}$
	$\frac{1}{6}$	

(c) Describe Homomorphic filtering.

7. Attempt any *two* parts of the following: 5 x 2 = 10

(a) Describe Watershed Segmentation Algorithm.

(b) Write a short note on sampling.

(c) Describe any one depth recover algorithm.