Printed pages: **Sub Code: NEC-032**

Paper Id: | | | | | **Roll No.** | | | | | | | | | | |

B.TECH
(SEM. VII) THEORY EXAMINATION 2017-18
DIGITAL IMAGE PROCESSING

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

Note: 1. Attempt all Sections.
2. Assume any missing data.

SECTION A

1. Attempt *all* questions in brief. 2 x10 = 20

a. Define Image?
b. What do you meant by Gray level?
c. Define Resolutions?
d. Write the properties of Hadamard transform?
e. Write down the type of image degradation?
f. Write short note on Image Restoration?
g. What is Data Compression?
h. Define Haar transform.
i. What is segmentation?
j. Why edge detection is most common approach for detecting discontinuities?

SECTION B

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

a. What are the various fundamental steps in digital image processing? Explain.
b. Why Hadamard Transform is most suitable for digital image processing? Discuss Hadamard Transform with the help mathematical expression.
c. Define and differentiate the inverse and wiener filter. Discuss the use of wiener filter in image processing. What do you mean by speckle? Describe a method for speckle reduction.
d. Explain Image Compression model in detail.
e. Define edge detection and edge linking. Also write the difference between them.

SECTION C

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

a. Explain sampling and quantization. What is the difference between uniform and non-uniform sampling and quantization?

b. Describe Physical Aspect of Image Acquisition. Also explain biological aspect of image acquisition.

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

a) Explain Image Enhancement Techniques and discuss the importance of spatial operations.
b) What do you mean by Gaussian noise and why is an averaging filter used to eliminate it?

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

a) What are the different ways to estimate the degradation function? Explain.

b) Discuss image restoration techniques. Explain in detail the image restoration in presence of noise only.

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

a) Explain in detail the image compression algorithms and its types.

b) Describe Inter-frame coding and predictive compression.

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

a) How can you control over segmentation problem? Explain it.

b) Explain edge linking using Hough transform.