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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.