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Roll No.

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

Time: 3 Hours

Note: 1. Attempt all Sections.

2. Assume any missing data.

SECTION A

1. Attempt *all* questions in brief.

- **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:

- 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:

- a. Explain sampling and quantization. What is the difference between uniform and nonuniform 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:

- 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?

 $10 \ge 3 = 30$

$10 \ge 1 = 10$

 $10 \ge 1 = 10$

Total Marks: 100

 $2 \times 10 = 20$



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5. Attempt any one parts of the following:

- 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:

- 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:

- a) How can you control over segmentation problem? Explain it.
- b) Explain edge linking using Hough transform.

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 $10 \ge 1 = 10$

 $10 \ge 1 = 10$

 $10 \ge 1 = 10$