

B. TECH
(SEM-VII) THEORY EXAMINATION 2018-19
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. What is the Digital Image Processing?
 - b. Listed the advantages of Wiener filter.
 - c. What is the need of Image enhancement?
 - d. What do you mean by degradation?
 - e. Define: Derivative operators.
 - f. Define: RGB image.
 - g. Compare the inverse filter with Wiener filter.
 - h. Listed the various elements of Digital Image Processing.
 - i. What is meant by crispering?
 - j. What is meant by reflectance?

SECTION B

2. Attempt any *three* of the following: 10 x 3 = 30
- a.
 - (i) Explain the various fundamental steps in DIP.
 - (ii) What is the importance of digitizer in DIP? Explain.
 - b. Write short note on:
 - (i) Hadamard Transform
 - (ii) Slant Transform
 - c. Explain Band pass Filter Technique for noise reduction. Also explain in detail Minimum Square Error Filtering.
 - d. Discuss about the principle of lossless compression algorithms with suitable examples.
 - e. Discuss the technique with example used for the following:
 - (i) Line Detection
 - (ii) Edge Detection

SECTION C

3. Attempt any *one* part of the following: 10 x 1 = 10
- (a) Explain the Physical and Biological aspect of Image Acquisition in detail.
 - (b)
 - (i) Explain sampling and quantization. Explain the effects of reducing sampling and quantization.
 - (ii) What do you mean by image processing? Explain the steps in image processing with the help of block diagram.

4. **Attempt any *one* part of the following:** **10 x 1 = 10**
- (a) What is the difference between image enhancement and image restoration? Mention some important causes of image degradation.
 - (b) Write short note on:
 - (i) Slant Transform
 - (ii) Hadamard Transform
5. **Attempt any *one* part of the following:** **10 x 1 = 10**
- (a) What is the Image Restoration? Draw and explain the basic block diagram of the restoration process. Give two areas where restoration process can be applied?
 - (b) (i) Differentiate between Image enhancement and image restoration process.
(ii) What is meant by exponential noise models? Explain.
6. **Attempt any *one* part of the following:** **10 x 1 = 10**
- (a) What do you mean by registration? Explain in brief the Geometrical transformation.
 - (b) Write short notes on:
 - (i) Inter-frame coding
 - (ii) Predictive compression.
7. **Attempt any *one* part of the following:** **10 x 1 = 10**
- (a) (i) Describe the technique of thresholding for image segmentation.
(ii) Explain the process of image segmentation using region growing.
 - (b) What do you mean by image segmentation? What are various image segmentation techniques? Describe due image segmentation technique.