B.TECH
(SEM VIII) THEORY EXAMINATION 2018-19
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 parallel image processing?
    b. Define Sampling and Quantization.
    c. Define Image Smoothing and Image Sharpening.
    d. List he properties of Walsh-Hadmard transform.
    e. What is Image enhancement?
    f. Define Contour coding?
    g. What is Image Segmentation?
    h. Define text recognistion.
    i. State Gestalt principle.
    j. What is edge linking?

SECTION B

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

    a. Explain Image-geometry and stereo imaging elements of visual perception.
    b. Explain periodic noise reduction by frequency domain filtering.
    c. Explain block coding and run length coding with suitable examples.
    d. Explain line and edge detection approaches in detail.
    e. Draw the block diagram of signature verification and explain its working.

SECTION C

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

    (a) What do you mean by image quantizer? Classify different types of image quantizer. What are the advantages of image quantizer?
    (b) What do you mean by Nyquist rate, aliasing and fold over frequency as related to Sampling of images? How the image is reconstructed from its samples?

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

    (a) What is histogram? For what purpose is it used? Explain histogram specification with example.
    (b) Find the expression for DFT of an N×N image u(m,n) and the properties of this transform.

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

    (a) What is Image Data Compression and why it is required? Describe Huffman compression in detail.

(b) Draw and explain the block diagram of a digital image restoration system. Explain Wiener filter.

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

   (a) Discuss the match based segmentation in detail. What is supervised and unsupervised evaluation? Differentiate with some examples.
   (b) Describe how image segmentations done using Thresholding approach.

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

   (a) What do you mean by shape analysis? Explain the various steps involved in shape analysis.
   (b) List the various practical applications of image processing. Explain Finger print classification briefly.