B. TECH.
(SEM VII) THEORY EXAMINATION 2022-23
DIGITAL IMAGE PROCESSING

Time: 3 Hours   *Total Marks: 100*

Note: Attempt all Sections. If you require any missing data, then choose suitably.

SECTION A

1. **Attempt *all* questions in brief.**   **2x10 = 20**
   (a) Define image segmentation.
   (b) What are the advantages of Wiener Filter.
   (c) Explain Hit-or-Miss transformation.
   (d) What is meant by pixel depth?
   (e) What is the need of picture compression?
   (f) Explain Homomorphism filtering.
   (g) What are the properties of Slant Transform?
   (h) What are the operating modes of JPEG format.
   (i) Explain about color image smoothing.
   (j) Identify the problems in region based segmentation.

SECTION B

2. **Attempt any *three* of the following:**   **10x3 = 30**
   (a) Discuss the application area of image processing in detail.
   (b) Why Hadamard transformation is most suitable for Digital image processing. Discuss with the help of mathematical equations.
   (c) Discuss and Differentiate between the image restoration and enhancement.
   (d) Write short note on:
       (i)   Band pass filter technique for noise reduction
       (ii) Minimum error square filtering.
   (e) Describe the working of color picture histogram processing.

SECTION C

3. **Attempt any *one* part of the following:**   **10x1 = 10**
   (a) Explain Sampling and Quantization. Discuss their various types.
   (b) Describe the properties of Fourier Transform.

4. **Attempt any *one* part of the following:**   **10 x1 = 10**
   (a) Discuss the process of image smoothing using ideal low pass filters and Butterworth low passfilters
   (b) What benefits can adaptive filters offer? Describe the adaptive median filter.

5. **Attempt any *one* part of the following:**   **10x1 = 10**
   (a) Explain image compression system with the help offunctional block diagram.
   (b) Describe the steps involved in changing colors from HSI to RGB.

6. **Attempt any *one* part of the following:**   **10x1 = 10**
   (a) What do you mean by Gaussian Noise and why averaging filter is used to eliminate it?
   (b) Explain Haar transform mean? Elaborate the process for calculating the haar transformation matrix.

7. **Attempt any *one* part of the following:**   **10x1 = 10**
   (a) Explain Edge Linking using Hough Transform.
   (b) Discuss the types of Image degradations in detail.