

(2 hours)

[Total Marks: 50]

- N. B.: (1) All questions are compulsory.
(2) Make suitable assumptions wherever necessary and state the assumptions made.
(3) Answers to the same question must be written together.
(4) Numbers to the right indicate marks.
(5) Draw neat labeled diagrams wherever necessary.
(6) Use of Non-programmable calculators is allowed.

1. Attempt any two of the following: 10
 - a. Mention the different methods the images are acquired. Explain the simple image formation model.
 - b. Discuss the mechanism used to restore the images in the presence of only noise. Explain various filters used to restore images.
 - c. How are the two basic primitive operations used in morphological image processing?
 - d. What are Active contours? Explain any one approach to locate boundary curves in images.
2. Attempt any two of the following: 10
 - a. Define an image. What is digital image processing? State and explain in brief the fields that use digital image processing.
 - b. Explain the concept of relationship between pixels.
 - c. Write a short note on
 - a) Contrast Stretching
 - b) Bit-plane slicing
 - d. What are Order-Statistic (Nonlinear) filters? Explain with an example.
3. Attempt any two of the following: 10
 - a. Explain the process of filtering in the frequency domain.
 - b. Discuss the steps in homomorphic filtering.
 - c. Give a summary of the three principal ways to estimate the degradation function for use in image restoration.
 - d. Explain Wavelet transform and its significance.
4. Attempt any two of the following: 10
 - a. What is pseudocolor image processing? Explain intensity slicing and color coding.
 - b. Explain the typical Digital watermarking system with a neat labeled diagram.
 - c. Use the LZW coding algorithm to encode the 7-bit ASCII string "aaaaaaaaaa".
 - d. Discuss briefly boundary extraction in images using morphology.
5. Attempt any two of the following: 10
 - a. Explain any two segmentation methods used to identify sharp, local intensity changes.
 - b. Why Canny Edge Detectors are considered superior among other edge detectors.
 - c. Write a short note on Image Segmentation: Level Sets
 - d. What are Signatures? Explain.