

Time :2 ½ Hours

[Total Marks: 50]

- N.B:**
- (1) **All questions are compulsory.**
 - (2) Figures to the **right** indicate full marks.
 - (3) **Assume additional data if necessary** but state the same clearly.
 - (4) Symbols have their usual meanings and tables have their usual standard design unless stated otherwise.
- Q.1 Attempt **any two** of the following (10)
- a) Briefly discuss about various types of noise and its effect in Signal and Image processing. 05
 - b) Define Correlation. How it useful in signal and image analysis. 05
 - c) Write a note on representing image as signal. 05
 - d) List and explain applications of digital signal processing. 05
- Q.2 Attempt **any two** of the following (10)
- a) Compare log and power law transformation on the image. 05
 - b) Explain how histogram processing is useful in image processing. Explain the terms histogram equalization and histogram matching. 05
 - c) Write a note on non-linear smoothing of images. Give example to explain the concept. 05
 - d) Explain what is Contrast Stretching? How it is used to enhance images. 05
- Q.3 Attempt **any two** of the following (10)
- a) List and explain Sobel and Prewitt edge detectors. 05
 - b) Briefly what are image pyramids? Also explain briefly Gaussian Pyramid. 05
 - c) Explain morphological opening and closing operations. What are its merits over erosion and dilation operations? 05
 - d) Briefly explain how we can extract boundary of an object in an image. 05
- Q.4 Attempt **any two** of the following (10)
- a) Briefly explain about scale-invariant feature transformations and its significance in image processing. 05
 - b) What is Haar-like Feature? Discuss in detail its use in image processing and analysis. 05
 - c) Write a brief note about the concept of using watershed algorithm for segmentation. 05
 - d) Write a note on GrabCut algorithm in Image Processing. 05
- Q.5 Attempt **any two** of the following (10)
- a) What is the effect of applying Laplacian on an image? Where is it used? 05
 - b) Write a note on LoG and DoG filters. 05
 - c) Define Skeletonization. Explain the operations and use of structuring elements in skeletonizing the given object structure. 05
 - d) Define Thresholding. Explain adaptive thresholding technique. 05
