

**Instructions:** All questions are compulsory. Use of non-programmable scientific calculator is allowed.

- Q.1** (a) Differentiate between 4-neighbors and 8-neighbors. (07)  
 (b) What is Morphological Processing? Explain each with example (07)  
**OR**  
 (a) Define Image Processing and list the fundamental steps involved. (07)  
 (b) Differentiate between Image Enhancement and Image Restoration with examples. (07)
- Q.2** (a) Explain OCR and its importance (07)  
 (b) Differentiate between spatial and frequency domain methods. (07)  
**OR**  
 (a) What is Histogram Equalization? Why is it useful? (07)  
 (b) Differentiate between Smoothing and Sharpening filters. (07)
- Q.3** (a) Differentiate between Local and Regional Processing. (07)  
 (b) Define Region-based Segmentation. (07)  
**OR**  
 (a) Explain Global vs Local Thresholding. (07)  
 (b) Define Hough Transform and list applications. (07)
- Q.4** (a) Differentiate between Lossy and Lossless Compression. (07)  
 (b) What is Blocking in Compression? (07)  
**OR**  
 (a) Discuss quantization in lossy compression. (07)  
 (b) What is redundancy in images? Give examples. (07)
- Q.5** Attempt any **SEVEN** out of **TWELVE**: (14)  
 (1) Expand the term OCR.  
 (2) Expand RGB and HSV.  
 (3) What is zero-padding?  
 (4) Expand DFT and FFT  
 (5) Define region of interest (ROI).  
 (6) Define contour in segmentation.  
 (7) Define binary segmentation.  
 (8) Mention one use of JPEG  
 (9) Expand JPEG and PNG.  
 (10) Define predictive coding.  
 (11) The smallest unit of a digital image is called:  
 (12) The intensity range of an 8-bit grayscale image is: