

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM
IV B. Tech I Semester Regular/Supplementary Examinations OCT/NOV 2025

IMAGE PROCESSING

(OPEN ELECTIVE)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

UNIT-I

1. a) Explain the components of an image processing system with a neat block diagram. [7M]
b) What are distance measures between pixels and explain them. [7M]
(OR)
2. a) Explain the concept of image sampling and quantization with examples. [7M]
b) Discuss the elements of visual perception in image processing. [7M]

UNIT-II

3. a) Discuss power-law (gamma) transformation with an example. [7M]
b) Explain sharpening filters using Laplacian filter. [7M]
(OR)
4. a) Explain averaging and median filters. [7M]
b) Discuss Histogram equalization with an example. [7M]

UNIT-III

5. a) Explain coding redundancy and interpixel redundancy. [7M]
b) Write short notes on JPEG, JPEG 2000, and MPEG standards. [7M]
(OR)
6. a) Explain run-length coding with an example. [7M]
b) Differentiate between lossless and lossy compression. [7M]

UNIT-IV

7. a) Discuss the principle of wavelet series expansion and show how a function can be expressed using scaling and wavelet functions. [7M]
b) Explain the 2D Discrete Wavelet Transform and its inverse. [7M]
(OR)
8. a) Explain scaling function and Multi-resolution analysis (MRA) refinement equation. [7M]
b) Describe the decomposition and reconstruction process in Discrete Wavelet Transform (DWT). [7M]

UNIT-V

9. a) Explain edge detection using Sobel and Prewitt operators. [7M]
b) Discuss basic grayscale morphological operations: erosion and dilation. [7M]
(OR)
10. a) What is region-based segmentation? Explain region growing and splitting. [7M]
b) List and explain the major applications of digital image watermarking. [7M]
