(c) Define image segmentation and discuss the various approaches used for image segmentation.

6. (a) Describe the concept of connectivity and region properties in binary images.

(b) Define image segmentation and discuss the various approaches used for image segmentation.

(c) Compare various edge detection operators such as Roberts, Sobel and Prewitt.

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No. of Printed Pages : 04

Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 33813 Roll No.

# B. Tech. Examination, 2025-26

## (Odd Semester)

## COMPUTER VISION

*Time : Three Hours]* *[Maximum Marks : 60*

**Note :–** Attempt all questions.

## SECTION–A

1. Attempt all parts of the following : 8×1=8

(a) What is computer vision? Write its two applications.

(b) Define morphological image processing.

(c) Explain thresholding.

(d) Describe template matching.

*[ P. T. O.*

(e) Explain erosion and dilation.

(f) Explain feature-based object recognition.

(g) Describe region splitting and merging algorithms.

(h) Explain edge detection. What is its significance?

## SECTION – B

2. Attempt any two parts of the following : 2×6=12

(a) What do you mean by thinning and thickening?

(b) Describe the basic morphological operations used in binary and grey scale image processing.

(c) Explain the mathematical formulation of the hough transform and its uses in detecting lines.

(d) Describe how keypoint detection methods such as SIFT and SURF are used in image matching?

## SECTION – C

**Note :–** Attempt all questions. Attempt any two parts from each questions. 8×5=40



3. (a) Describe the process and importance of connected component labelling in binary image analysis.

(b) Discuss the difference between boundary descriptors and region descriptors in image representation and description.

(c) Describe the principles of perspective projection and inverse perspective projection in computer vision.

4. (a) Explain region splitting and merging techniques used in segmentation.

(b) Explain edge detection and describe the characteristics of a good edge detector.

(c) Describe the Canny edge detection algorithm in detail with its mathematical formulation.

5. (a) Explain the concept of object modeling and its importance in computer vision.

(b) Describe the process of feature extraction and its role in object recognition.

*[ P. T. O.*