

# CBCS SCHEME

USN

BAI515A

**Fifth Semester B.E./B.Tech. Degree Examination, June/July 2025**

# Computer Vision

Time: 3 hrs.

Max. Marks: 100

**Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.**

2. *M*: Marks, *L*: Bloom's level, *C*: Course outcomes.

| Module – 1        |    |                                                                                                                                                                             | M  | L  | C   |
|-------------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|----|-----|
| Q.1               | a. | With a neat diagram, explain the image sensing pipeline and its important effects.                                                                                          | 10 | L2 | CO1 |
|                   | b. | Explain in detail the Bidirectional Reflectance Distribution Function (BRDF).                                                                                               | 10 | L2 | CO1 |
| <b>OR</b>         |    |                                                                                                                                                                             |    |    |     |
| Q.2               | a. | Explain the linear filtering along with examples of linear filtering.                                                                                                       | 10 | L2 | CO1 |
|                   | b. | Explain the following with respect to image processing:<br>i) Pixel Transforms      ii) Compositing and Matting.                                                            | 10 | L2 | CO1 |
| <b>Module – 2</b> |    |                                                                                                                                                                             |    |    |     |
| Q.3               | a. | Explain the concept of morphology in Image Processing.                                                                                                                      | 10 | L2 | CO2 |
|                   | b. | With a neat diagram explain the Fourier transforms in detail along with 2-D Fourier transforms.                                                                             | 10 | L2 | CO2 |
| <b>OR</b>         |    |                                                                                                                                                                             |    |    |     |
| Q.4               | a. | Explain the wavelets of Image Processing. Describe the application of Laplacian Pyramid.                                                                                    | 10 | L2 | CO2 |
|                   | b. | Explain the following with geometric transformations:<br>i) Forward warping algorithm<br>ii) Inverse warp algorithm<br>iii) MIP-mapping<br>iv) Elliptical weighted average. | 10 | L2 | CO2 |
| <b>Module – 3</b> |    |                                                                                                                                                                             |    |    |     |
| Q.5               | a. | Explain the Noise Probability density functions in detail.                                                                                                                  | 10 | L2 | CO3 |
|                   | b. | Explain the concept of band reject filters, bandpass filter and notch filters to reduce the noise by frequency domain filtering.                                            | 10 | L2 | CO3 |
| <b>OR</b>         |    |                                                                                                                                                                             |    |    |     |
| Q.6               | a. | Explain how to detect the isolated points and line in image segmentation.                                                                                                   | 10 | L2 | CO3 |
|                   | b. | Write the region-growing algorithm for 8-connectivity. Explain the concept of region splitting and merging.                                                                 | 10 | L2 | CO3 |

1 of 2

## Module – 4

|     |    |                                                                                                                |    |    |     |
|-----|----|----------------------------------------------------------------------------------------------------------------|----|----|-----|
| Q.7 | a. | Explain different color models along with conversion technique of one model to another model and vice-versa.   | 10 | L2 | CO4 |
|     | b. | Write a short notes on:<br>i) Color image smoothing<br>ii) Color image sharpening<br>iii) Noise in color image | 10 | L2 | CO4 |

## OR

|     |    |                                                              |    |    |     |
|-----|----|--------------------------------------------------------------|----|----|-----|
| Q.8 | a. | Explain in detail image segmentation process based on color. | 10 | L2 | CO4 |
|     | b. | Explain the concept of pseudocolor image processing.         | 10 | L2 | CO4 |

## Module – 5

|     |    |                                                                                                                                   |    |    |     |
|-----|----|-----------------------------------------------------------------------------------------------------------------------------------|----|----|-----|
| Q.9 | a. | With the help of a diagrams explain the concept of erosion, dilation, opening and closing used in morphological image processing. | 10 | L2 | CO5 |
|     | b. | Explain any 5 basic morphological algorithms.                                                                                     | 10 | L2 | CO5 |

## OR

|      |    |                                                                                                                    |    |    |     |
|------|----|--------------------------------------------------------------------------------------------------------------------|----|----|-----|
| Q.10 | a. | Explain the following with respect to feature extraction :<br>i) Boundary (Border) following      ii) Chain codes. | 10 | L2 | CO5 |
|      | b. | Explain any two object recognition based on decision theoretic methods.                                            | 10 | L2 | CO5 |

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