CBCS SCHEME

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BAI515A

# Fifth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.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.** | What is Compute Vision? Why is vision so difficult? Discuss the real – world examples of computer vision. | **10** | **L1** | **CO1** |
| | **b.** | Explain the behavior of pinhole camera under different effects using a clear illustration to show the real–world example. | **10** | **L2** | **CO1** |
| | | **OR** | | | |
| **Q.2** | **a.** | Explain the phong shading model. | **8** | **L2** | **CO1** |
| | **b.** | Explain the Di-chromatic reflectance model. | **5** | **L2** | **CO1** |
| | **c.** | What is meant by image filtering? Clearly discuss types of filter. | **7** | **L1** | **CO1** |
| | | **Module – 2** | | | |
| **Q.3** | **a.** | Differentiate between a linear spatial filter and a non-linear spatial filter. Explain why bilateral filtering is quite show compared to regular separable filtering. | **10** | **L2** | **CO2** |
| | **b.** | Explain the binary image processing. Obtain the distance transform D(i, j) of a binary image B(i, j). | **10** | **L2** | **CO2** |
| | | **OR** | | | |
| **Q.4** | **a.** | Explain the derivation of Discrete Fourier Transform (DFT) form the continuous transform of the sampled function. | **10** | **L2** | **CO2** |
| | **b.** | What are the geometric transformation? Explain the forward warping algorithm for transforming an image. | **10** | **L1** | **CO3** |
| | | **Module – 3** | | | |
| **Q.5** | **a.** | Give the probability density functions for Gaussion noise model and Rayleigh noise models. | **10** | **L1** | **CO3** |
| | **b.** | Discuss the noise reduction capabilities of the following spatial filters :<br>i) Arithmetic mean filter<br>ii) Geometric mean filter. | **10** | **L1** | **CO3** |
| | | **OR** | | | |
| **Q.6** | **a.** | Explain the image gradient and its properties. | **10** | **L2** | **CO3** |
| | **b.** | Explain the following gradient operators :<br>i) Roberts cross –gradient operators<br>ii) Sobel operator<br>iii) Prewitt operator<br>iv) Laplacian operator. | **10** | **L2** | **CO3** |



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| | | **Module – 4** | | | |
| **Q.7** | **a.** | Define the pseudocolor processing of digital images. Explain the graphical interpretation of the intensity slicing technique. | **10** | **L2** | **CO4** |
| | **b.** | Discuss the procedure for conversion from RGB color model to HIS color model. | **10** | **L2** | **CO4** |
| | | **OR** | | | |
| **Q.8** | **a.** | Illustrate how full-color images are handled for a variety of image processing tasks. | **10** | **L2** | **CO4** |
| | **b.** | Explain the color image smoothing and sharpening procedure. | **10** | **L2** | **CO4** |
| | | **Module – 5** | | | |
| **Q.9** | **a.** | Explain how morphological operations are performed between images and structuring elements. | **10** | **L2** | **CO5** |
| | **b.** | Write short notes on the following :<br>i) Erosin<br>ii) Dialation. | **10** | **L2** | **CO5** |
| | | **OR** | | | |
| **Q.10** | **a.** | Explain the procedures in the "boundary following" algorithm that traces the boundary in binary image. | **10** | **L2** | **CO5** |
| | **b.** | What is Pattern Classification? Explain the minimum distance classifier. | **10** | **L2** | **CO5** |

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