Roll.No. | 22UAICT5007

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc.Cs with AI - END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - V
22UAICT5007 - Computer Vision

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Define Computer Vision and differentiate it from Image Processing and Computer Graphics.Briefly explain the levels of computer vision:
   - Low-level
   - Mid-level
   - High-level
2. Explain how convolution is used for image filtering, and briefly describe the role of kernels in this process. Include one example of a commonly used convolution filter.
3. Explain briefly about Histogram Processing with its applications.
4. Explain the role of Gabor Filters and Discrete Wavelet Transform (DWT) in feature extraction for image processing. Highlight how each technique contributes to texture analysis and multi-resolution representation.
5. What is Contour-Based Representation in image segmentation? Explain how contours are used to represent object boundaries and mention one advantage and one limitation of this method.
6. Explain the fundamental concepts of object Recognition and Medical Image Analysis in computer vision.
7. Explain the role of particle filters in object tracking within surveillance systems. How do they help in handling occlusion and dynamic motion?
8. What is the significance of human gait analysis in computer vision applications? Mention one method used and a real-world use case.

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Discuss in detail various types of computer vision.

Contd...

10. a) Define the Fourier Transform in the context of digital image processing.
    b) Explain how the Fourier Transform is used for image analysis and enhancement.
    Include the following in your answer:
    i. Frequency domain representation of images
    ii. Importance of magnitude and phase components
    iii. Applications in filtering and noise reduction

11. Explain the concept of Region-Based Representation in image segmentation. Discuss how this method differs from contour-based approaches and describe the techniques used to segment images based on regions.
    Your answer should include:
    - Definition and purpose of region-based segmentation.
    - Common algorithms (e.g., region growing, region splitting and merging)
    - Advantages and limitations.
    - Applications in real-world computer vision tasks.

12. Explain in detail about 2D & 3D Geometric Transformations with examples.

13. Explain the process of Face Recognition in computer vision applications. Your answer should include:
    - The difference between face detection and face recognition.
    - Techniques used for face recognition (e.g., feature-based, appearance-based, deep learning methods)
    - Role of Active Appearance Models and 3D Shape Models.
    - Applications in photo album organization, surveillance, and security systems.
    - Challenges such as occlusion, lighting variation, and pose changes.

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