R20

MALLA REDDY COLLEGE OF ENGINEERING & TECHNOLOGY
(Autonomous Institution – UGC, Govt. of India)
IV B.Tech I Semester Regular Examinations, November 2024
Computer Vision
(B.Tech-AIDS & B.Tech-AIML)

Roll No										

Time: 3 hours   **Max. Marks: 70**

Note: This question paper Consists of 5 Sections. Answer **FIVE** Questions, Choosing ONE Question from each SECTION and each Question carries 14 marks.

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		SECTION-I	**BCLL**	**CO(s)**	**Marks**
1	A	State different limitations of a pinhole camera and how to overcome these limitations. Write a short note on thin lenses.	L2	CO-I	[7M]
	B	Explain Intrinsic and Extrinsic Parameters	L2	CO-I	[7M]
		OR			
2	A	What is inter-reflection, and why is it important in realistic rendering?	L1	CO-I	[7M]
	B	How do different shading models contribute to our understanding of object surfaces and their features?	L2	CO-I	[7M]
		SECTION-II			
3	A	What is Convolution? Explain the Key Uses of Convolution in Computer Vision	L2	CO-II	[10M]
	B	Define Texture. Explain various Techniques for Shape from Texture	L2	CO-II	[4M]
		OR			
4	A	Discuss the significance of local image features in image analysis. How is the image gradient computed, and what information does it provide about the image?	L2	CO-II	[7M]
	B	Analyze the concept of orientations in image processing. How can orientation information enhance image analysis, particularly in the context of edge and texture detection?	L4	CO-II	[7M]
		SECTION-III			
5	A	Discuss the concept of segmentation by clustering in image processing. How do basic clustering methods, such as K-means, facilitate the separation of distinct regions in an image?	L2	CO-III	[8M]
	B	Discuss the application of Kalman filters in tracking linear dynamical models. How do Kalman filters predict and update the state of a system over time, and what are their advantages in tracking scenarios?	L2	CO-III	[6M]
		OR			
6	A	Discuss the Watershed Algorithm in detail	L3	CO-III	[7M]
	B	Discuss the process of fitting lines using the Hough Transform. What mathematical principles underlie this technique, and how does it handle noisy data in image	L3	CO-III	[7M]

processing?

SECTION-IV

| 7 | A | Compare and contrast the methods used for registering rigid and deformable objects | L2 | CO-IV | [7M] |
| | B | Analyse the concept of the bitangent ray manifold in relation to surface representation and analysis. | L4 | CO-IV | [7M] |

OR

| 8 | A | Evaluate the concepts of classification, error, and loss in the context of machine learning and computer vision. | L5 | CO-IV | [6M] |
| | B | How do contour lines provide insight into the shape and characteristics of a surface, and what mathematical principles underpin this concept? Provide examples of applications in computer graphics and modeling. | L3 | CO-IV | [8M] |

SECTION-V

| 9 | A | Explain the sliding window method for object detection. How does this technique work, and what are its advantages and limitations in detecting objects within images? | L2 | CO-V | [7M] |
| | B | How do systems recognize and categorize human activities from video data, and what are the implications for applications such as healthcare and human-computer interaction? | L2 | CO-V | [7M] |

OR

| 10 | A | Discuss the process of object recognition, focusing on categorization and selection. | L2 | CO-V | [7M] |
| | B | Discuss the importance of detecting objects in images within the field of computer vision. What are the main challenges associated with object detection | L2 | CO-V | [7M] |

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