GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2022

Subject Code:3171614   **Date:12-01-2023**
Subject Name:Computer Vision
Time:10:30 AM TO 01:00 PM   **Total Marks:70**
Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	**(a)**	Define the term: computer vision. Write difference(s) between image processing and computer vision.	**03**
	(b)	How do we represent an image in computer? Explain in brief. Also list the various types of computer image?	**04**
	(c)	Write and explain various applications of computer vision.	**07**
Q.2	**(a)**	What is radiometry? Explain photometric image formation in detail.	**03**
	(b)	Explain any two morphological operations in brief with neat sketches.	**04**
	(c)	Write a detailed note on histogram equalization.	**07**
		OR	
	(c)	Explain image segmentation in brief. Also discuss various approaches for image segmentation.	**07**
Q.3	**(a)**	What do you mean by image enhancement? What is need of the same?	**03**
	(b)	Write the differences between rigid and affine transformation.	**04**
	(c)	Elaborate the following image geometric operations with proper illustration: - Translation, - Rotation, - Scaling, and - Shearing.	**07**
		OR	
Q.3	**(a)**	Write basic steps for filtering in the frequency domain.	**03**
	(b)	Explain radial distortion in camera calibration.	**04**
	(c)	Elaborate snake's method for active contours.	**07**
Q.4	**(a)**	Discuss the concepts of motion parallax in brief.	**03**
	(b)	What is descriptor? Explain SIFT descriptor in detail.	**04**
	(c)	Explain intrinsic and extrinsic parameters related to camera models. Also state usefulness for these kinds of parameters in the field of computer vision.	**07**
		OR	
Q.4	**(a)**	Which approaches are for appearance based method in object recognition? Explain them in brief.	**03**
	(b)	Explain Kalman filtering in motion tracking.	**04**
	(c)	Write the need of corner detection. Elaborate any one method or algorithm for corner detection.	**07**
Q.5	**(a)**	What is camera calibration? Explain pinhole camera models in detail.	**03**
	(b)	What do you mean by noisy image? List various types of noise and explain each in brief.	**04**
	(c)	Briefly explain edge detection. Explain any one method or algorithm for edge detection.	**07**

OR

Q.5 **(a)** Write various applications of motion tracking. Explain each in brief. **03**

(b) State differences between low pass filtering and high pass filtering. **04**
(c) Write a detailed note on optical flow algorithm. **07**

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