# GUJARAT TECHNOLOGICAL UNIVERSITY
## BE – SEMESTER- VII EXAMINATION-SUMMER 2023

**Subject Code: 3171614**                                    **Date: 19/06/2023**
**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 following terms | **03** |
|   |   | (i) Digital Image (ii) Radiometry (iii) Image Formation. |   |
|   | **(b)** | What is the Image Geometric/Spatial Transformation? Why it is used? | **04** |
|   | **(c)** | What is computer vision? Explain the various applications of computer vision. | **07** |
|   |   |   |   |
| **Q.2** | **(a)** | List out the Advantages of SIFT Features. | **03** |
|   | **(b)** | Write down the Morphological Operations. | **04** |
|   | **(c)** | Explain Arithmetic Mean Filter with example. | **07** |
|   |   | **OR** |   |
|   | **(c)** | Describe the Fisheye Camera Models. | **07** |
|   |   |   |   |
| **Q.3** | **(a)** | Explain the Applications of motion tracking. | **03** |
|   | **(b)** | Write on note an Invariant Classification. | **04** |
|   | **(c)** | What is image segmentation? Explain mean shift segmentation in detail. | **07** |
|   |   | **OR** |   |
| **Q.3** | **(a)** | Give difference of Enhancement and Restoration. | **03** |
|   | **(b)** | Explain Discrete Fourier Transform(DFT). | **04** |
|   | **(c)** | List out the Types of geometric Transformation and explain each. | **07** |
|   |   |   |   |
| **Q.4** | **(a)** | Give and explain Hit, Miss and Fit Structuring Elements. | **03** |
|   | **(b)** | Explain an Intrinsic and Extrinsic Parameters. | **04** |
|   | **(c)** | Write down the steps of Region Split and Merge. | **07** |
|   |   | **OR** |   |
| **Q.4** | **(a)** | Describe an Active Contour. | **03** |
|   | **(b)** | Explain Projections and types of projections | **04** |
|   | **(c)** | What is optical flow? Discuss optical flow in motion analysis. | **07** |
|   |   |   |   |
| **Q.5** | **(a)** | Explain Feature-based Techniques | **03** |
|   | **(b)** | Write a note HOG(Histogram of Oriented Gradients). | **04** |
|   | **(c)** | Discuss the Filtering Correlation and  Filtering Convolution. | **07** |
|   |   | **OR** |   |
| **Q.5** | **(a)** | Define: Point Detection, Line Detection, Edge Detection | **03** |
|   | **(b)** | Explain Linear Stretching and Histogram Stretching with example. | **04** |
|   | **(c)** | Explain the Kalman Filtering and Different function of the Kalman filter. | **07** |

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