# GUJARAT TECHNOLOGICAL UNIVERSITY
## BE - SEMESTER–VII EXAMINATION – SUMMER 2025

**Subject Code:3171109**                                                    **Date:08-05-2025**
**Subject Name:Digital Image and Video Processing**
**Time:02:30 PM TO 05:00 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)** | What is Digital Image Processing? Mention applications of Digital Image Processing. | **03** |
|  | **(b)** | Explain components of an image processing system. | **04** |
|  | **(c)** | Write a note on elements of visual perception. | **07** |
|  |  |  |  |
| **Q.2** | **(a)** | What is Spatial and Intensity Resolution for digital image? | **03** |
|  | **(b)** | Explain how Image Sampling and Quantization is done? | **04** |
|  | **(c)** | Explain Image Sensing and Acquisition in Digital Image Processing. | **07** |
|  |  | **OR** |  |
|  | **(c)** | What is Gray level transformation function? Explain Image Negative, Log transformation and Power-Law (Gamma) transformation in DIP. | **07** |
|  |  |  |  |
| **Q.3** | **(a)** | What is the difference between filtering in spatial domain and frequency domain? | **03** |
|  | **(b)** | Explain the basic steps for filtering used to enhance an image in frequency domain. | **04** |
|  | **(c)** | What do you mean by order-statistic filter? Explain Median filtering with suitable example. | **07** |
|  |  | **OR** |  |
| **Q.3** | **(a)** | How to segment the image? Explain region-based segmentation. | **03** |
|  | **(b)** | Compare Pseudocolor and Full-color image processing. | **04** |
|  | **(c)** | Explain RGB Color model in detail. | **07** |
|  |  |  |  |
| **Q.4** | **(a)** | How to measure Euclidian distance, City block distance and Chessboard distance between pixels in Digital Image Processing? | **03** |
|  | **(b)** | Write a note on continuous wavelet transform. | **04** |
|  | **(c)** | What is histogram? What is histogram equalization? Write steps for histogram equalization. | **07** |
|  |  | **OR** |  |
| **Q.4** | **(a)** | Explain different types of redundancies with figures. | **03** |
|  | **(b)** | Explain classification of Image Enhancements. | **04** |
|  | **(c)** | Compare lossy compression and lossless compression. | **07** |
|  |  |  |  |
| **Q.5** | **(a)** | State differences between Huffman coding and Arithmetic coding. | **03** |
|  | **(b)** | Draw elements of a video encoder and decoder. | **04** |
|  | **(c)** | Explain MPEG video coding standard. | **07** |

**OR**

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|---|---|---|---|
| **Q.5** | **(a)** | What is motion-based segmentation? | **03** |
| | **(b)** | Explain video object detection and tracking. | **04** |
| | **(c)** | Compare JPEG and JPEG-2000. | **07** |

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