

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2022****Subject Code:3171109****Date:14/06/2022****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.

		<b>MARKS</b>
<b>Q.1</b>	(a) How do you represent the digital images?	<b>03</b>
	(b) Discuss about the Neighbors of a pixel and Connectivity with neat diagrams.	<b>04</b>
	(c) Explain about sampling and quantization of an image in detail.	<b>07</b>
<b>Q.2</b>	(a) Write about Smoothing using Spatial filters.	<b>03</b>
	(b) Define histogram of a digital image. Explain how histogram is useful in image enhancement?	<b>04</b>
	(c) What is meant by image enhancement by point processing? Discuss any two methods in it.	<b>07</b>
	<b>OR</b>	
	(c) Discuss how the Bit Plane Slicing is useful in image processing with example.	<b>07</b>
<b>Q.3</b>	(a) Explain the basic steps for filtering used to enhance an image in frequency domain.	<b>03</b>
	(b) What is Thresholding? Explain about Global thresholding in detail.	<b>04</b>
	(c) Explain the method of using the second derivate for Image sharpening by Laplacian Operator.	<b>07</b>
	<b>OR</b>	
<b>Q.3</b>	(a) What is Inter-pixel and Psycho-visual redundancy?	<b>03</b>
	(b) Explain the Image addition and subtraction.	<b>04</b>
	(c) Discuss about the Prewitt and Sobel edge Detectors.	<b>07</b>
<b>Q.4</b>	(a) Explain the lossy and lossless image compression.	<b>03</b>
	(b) Discuss the RGB color model in detail.	<b>04</b>
	(c) Explain the block diagram of JPEG image compression model in detail.	<b>07</b>
	<b>OR</b>	
<b>Q.4</b>	(a) Explain about Region growing.	<b>03</b>
	(b) Briefly discuss on Discrete Cosine Transform.	<b>04</b>
	(c) Write a short note on Color Segmentation.	<b>07</b>
<b>Q.5</b>	(a) Briefly discuss forward and backward motion prediction in video coding.	<b>03</b>
	(b) Explain frame classification - I, P and B in video compression.	<b>04</b>
	(c) What is Wavelet? What are the properties of it? Discuss the main steps involved in Continuous Wavelet Transform	<b>07</b>

**OR**

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| <b>Q.5</b> | (a) | Explain uncertainty principles of Fourier Transform.   | <b>03</b> |
|            | (b) | Explain shot boundary detection in video segmentation. | <b>04</b> |
|            | (c) | Write short note on Video coding standards.            | <b>07</b> |

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