Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2022

Subject Code:3161604 Date:08/06/2022

Subject Name:Image Processing

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)**	Explain Electromagnetic Spectrum.	**03**
	(b)	What are the real world applications of Image Processing?	**04**
	(c)	Define the Image Enhancement. Explain different Spatial domain Enhancement method.	**07**
Q.2	**(a)**	What is histogram equalization? Demonstrate with example.	**03**
	(b)	Difference between lossy and lossless image compression?	**04**
	(c)	Explain basic gray level transformations.	**07**
		OR	
	(c)	Explain following terms: 1) Luminance 2) Radiance 3) Brightness 4) Contrast 5) Intensity and Spatial Resolution 6) Modulation Transfer Function 7) Dynamic Range.	**07**
Q.3	**(a)**	Explain Image restoration Model.	**03**
	(b)	Explain Colour Slicing and Colour Complements in Colour transformation.	**04**
	(c)	Explain spatial correlation and convolution with suitable example.	**07**
		OR	
Q.3	**(a)**	Write a short not on Butterworth low pass filter.	**03**
	(b)	Explain DFT and DCT with their applications in image processing field.	**04**
	(c)	List out the applications of each colour model. Explain any one colour model in brief.	**07**
Q.4	**(a)**	Discuss RLE compression algorithm.	**03**
	(b)	How gradient is useful to detect the discontinuity in image?	**04**
	(c)	Explain: RGB and HIS colour models.	**07**
		OR	
Q.4	**(a)**	Explain mach band effect and weber ratio.	**03**
	(b)	Differentiate: Image enhancement vs. Image Restoration.	**04**
	(c)	Describe image pyramid technique.	**07**
Q.5	**(a)**	Explain Hough Transform.	**03**
	(b)	What is Histogram? Draw histogram patterns of Dark, Bright, Low and High contrast Image.	**04**
	(c)	Write a note on Geometric mean and contra harmonic mean filters.	**07**
		OR	
Q.5	**(a)**	Discuss Spatial and Temporal Redundancy of an Image.	**03**
	(b)	What is edge? Explain the types of discontinuities in image.	**04**
	(c)	Explain Image segmentation using Global Thresholding.	**07**

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