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

Subject Code:3172417   **Date:08/06/2022**
Subject Name:Image 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)	Define Digital Image Processing? What are the motivations/purposes behind digital image processing?	03
	(b)	What are different types of Digital Images?	04
	(c)	Write a note on Image sensing and acquisition in digital image processing.	07
Q.2	(a)	List fundamentals steps in Digital Image Processing.	03
	(b)	What is a pixel? What is 4 adjacency, 8 adjacency and m adjacency/mixed adjacency?	04
	(c)	Write a note on different components of a digital image processing system?	07

OR

	(c)	Explain Image Sampling and Quantization? What is sampling resolution and quantization resolution?	07
Q.3	(a)	What is contrast stretching transformation function and thresholding transformation function?	03
	(b)	What is Image Negative? Explain with example.	04
	(c)	What is histogram equalization? List different steps of histogram equalization.	07

OR

Q.3	(a)	What is the difference between filtering in spatial domain and filtering in frequency domain for DIP?	03
	(b)	Explain different steps for filtering in the frequency domain.	04
	(c)	Explain the Laplacian in the frequency domain.	07
Q.4	(a)	Draw and explain the chromaticity diagram.	03
	(b)	State the differences between full color image processing and pseudo color image processing.	04
	(c)	What are color models? Compare RGB, CMYK and HSI color models.	07

OR

Q.4	(a)	What is wavelet? Explain wavelet transform in brief.	03
	(b)	Write a short note on Haar transform.	04
	(c)	Explain Multi resolution expansions in detail.	07
Q.5	(a)	Explain the concept of morphological opening and closing.	03
	(b)	Dilation and Erosion are two primitive operators, which may be used to define other morphological operations. (a) Explain how erosion is performed.	04

(b) Explain how dilation is performed.

(c) What do you mean by structuring element? Draw structuring elements for various morphological operations **07**

<div align="center">OR</div>

Q.5 (a) Explain smoothing filters in spatial domain. **03**

(b) Explain Bit plane slicing for gray level image. **04**

(c) State and explain applications of digital image processing. **07**

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