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

Subject Code:3171109   **Date:16-01-2023**
Subject Name:Digital Image and Video 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)	What is Digital Image Processing?	03
	(b)	Mention different applications of Digital Image Processing.	04
	(c)	What is image sensing? Explain Image Acquisition using a Single Sensor, Sensor Strips and Circular sensor strips.	07
Q.2	(a)	List fundamentals steps in Digital Image Processing.	03
	(b)	What is a pixel? What are 4 neighbors, diagonal neighbors and 8 neighbors of pixel?	04
	(c)	What are 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 Log transformation in DIP?	03
	(b)	What is histogram equalization? List different steps of histogram equalization.	04
	(c)	What is smoothing/averaging spatial filters? Is smoothing filter good for salt and pepper noise? If not, what is the solution?	07
		OR	
Q.3	(a)	What are the advantages of filtering in frequency domain for DIP?	03
	(b)	Explain different steps for filtering in the frequency domain.	04
	(c)	What are color models? Compare RGB, CMYK and HSI color models.	07
Q.4	(a)	Explain color complements transformation using color wheel.	03
	(b)	Discuss region based segmentation.	04
	(c)	What is image segmentation. Explain the method of image segmentation by the pixel aggregation with the help of suitable example.	07
		OR	
Q.4	(a)	What is wavelet? Explain wavelet transform in brief.	03
	(b)	State the differences between lossy compression and lossless compression.	04
	(c)	Explain Huffman encoding with an example.	07
Q.5	(a)	What is redundancy in image? List different types of redundancy available in the digital image.	03
	(b)	Explain forward and backward motion prediction.	04
	(c)	Explain MPEG video coding standard in detail.	07

OR

Q.5	(a)	Explain Inter frame redundancy.	**03**
	(b)	Explain temporal segmentation in brief.	**04**
	(c)	Write a note on video object detection and tracking.	**07**

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