MARRI LAXMAN REDDY
INSTITUTE OF TECHNOLOGY AND MANAGEMENT
(AN AUTONOMOUS INSTITUTION)
(Approved by AICTE, New Delhi & Affiliated to JNTUH, Hyderabad)
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MLRS

IV B.Tech I Sem Regular End Examination, Nov/Dec 2022
Digital Image Processing (PE-III)
(ECE)

Time: 3 Hours.   Max. Marks: 70

Note: 1. Question paper consists: Part-A and Part-B.
      2. In Part – A, answer all questions which carries 20 marks.
      3. In Part – B, answer any one question from each unit.
      Each question carries 10 marks and may have a, b as sub questions.

PART- A

(10*2 Marks = 20 Marks)

1.	a)	Write the expression to find the number of bits to store a digital image? Also Find the number of bits required to store a 256 X 256 image with 32 gray levels.	2M	CO1	BL3
	b)	Write the Walsh transform forward and reverse kernels.	2M	CO1	BL1
	c)	Define histogram? And how it is useful for image enhancement.	2M	CO2	BL2
	d)	What is the difference between spatial and frequency domain in filtering used in image enhancement.	2M	CO2	BL2
	e)	Compare image enhancement and restoration techniques?	2M	CO3	BL2
	f)	Give the relation for degradation model for continuous function?	2M	CO3	BL1
	g)	Write the applications of segmentation.	2M	CO4	BL1
	h)	List the various methods of thresholding in image Segmentation.	2M	CO4	BL1
	i)	What is the Need for Compression?	2M	CO5	BL1
	j)	State fidelity criterion & list its types.	2M	CO5	BL1

PART- B

(10*5 Marks = 50 Marks)

2	a)	Explain the steps involved in digital image processing with neat diagram.	5M	CO1	BL2
	b)	Construct the slant transform matrix for N=8.	5M	CO1	BL3

OR

3	a)	State and prove the separability property of the 2D-DFT.	5M	CO1	BL2
	b)	Demonstrate the various distance measures between the pixels with an example.	5M	CO1	BL2

4	a)	Explain the various filters used for sharpening of image in frequency domain.	5M	CO2	BL3
	b)	What is high boost spatial filtering? Compare it with high pass spatial filtering	5M	CO2	BL2

OR

5	a)	Explain the following Enhancement operations: i)Bit plane slicing (ii) Grey level slicing.	5M	CO2	BL3
	b)	What is meant by the Gradient and the Laplacian? Discuss their role in image enhancement.	5M	CO2	BL6
6	a)	Explain the method of Constrained Least Squares Filtering for image restoration	5M	CO3	BL3
	b)	Discuss the process of image restoration by direct inverse filtering?	5M	CO3	BL3

OR

7	a)	Explain about image degradation model with algebraic approach.	5M	CO3	BL3
	b)	Discuss the interactive restoration of an image.	5M	CO3	BL2
8	a)	Explain how to detect discontinuities in image segmentation?	5M	CO4	BL2
	b)	Determine the importance of Hit-or-Miss morphological transformation operation on a digital binary image	5M	CO4	BL5

OR

9	a)	Describe the Region Splitting and Merging method with an example	5M	CO4	BL5
	b)	Explain the opening operation in image morphology with examples?	5M	CO4	BL5
10	a)	Write a short note on JPEG 2000 standards	5M	CO5	BL2
	b)	Draw the block diagram of image compression system. Discuss each block detail.	5M	CO5	BL3

OR

11	a)	Develop an arithmetic code for a given data and message sequence: "aaieuo!"	5M	CO5	BL6

Symbol	Probability
a	0.2
e	0.3
i	0.1
o	0.2
u	0.1
!	0.1

	b)	Explain how compression is achieved using DCT.	5M	CO5	BL5

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CO - Course Outcome   **BL - Blooms Taxonomy Levels**