R18

Code No: 157BF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, February - 2025

DIGITAL IMAGE PROCESSING

(Electronics and Communication Engineering)

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) 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

(25 Marks)

1.a)	What do you meant by Gray level?	[2]
b)	What is meant by pixel?	[3]
c)	What is contrast stretching?	[2]
d)	Specify the objective of image enhancement technique.	[3]
e)	What are the two methods of algebraic approach?	[2]
f)	What is meant by Image Restoration?	[3]
g)	Define region growing.	[2]
h)	Give the properties of the second derivative around an edge.	[3]
i)	What is the need for Compression?	[2]
j)	Define arithmetic coding.	[3]

PART – B

(50 Marks)

2. For the given image matrix find Walsh transform and also Hadamard transform. [10]

F[m,n] = [1 1 2 2 ; 2 2 1 1 ; 2 2 2 2 ; 1 1 1 1]

OR

3. Consider the image segment shown below

3 1 2 1(q)
2 2 0 2
1 2 1 2
(p) 1 0 1 2

Let V={0,1} compute the D4 and D8 distances between **p** and **q.** [10]

4.a) Explain histogram equalization with an example.
b) Explain image enhancement in the frequency domain. [5+5]

OR

5. Explain how spatial filters are used to enhance the image? Explain how these filters are different from frequency domain enhancement? [10]

6.a) What is meant by image degradation? Discuss various possibilities for image degradation.
b) Discuss about Constrained Least square restoration for a digital image in detail. [5+5]

OR

7. What is meant by inverse filtering? Derive an expression for inverse filtering? What are the drawbacks of this method in the presence of noise? [10]

8.a) Explain various thresholding techniques that are used in segmentation.
b) What is meant by morphology? Explain about Hit or Miss Operation [5+5]

OR

9.a) Explain point detection and line detection.
b) Explain about region-based segmentation. [5+5]

10. Discuss salient features of JPEG2000 that make it effective in vast areas of applications. [10]

OR

11.a) How many unique Huffman codes are there for a three-symbol source? Construct them.
b) Discuss the importance of image compression. Discuss about inter pixel redundancy. [5+5]

---ooOoo---