

Duration: 3 hours

[Max Marks:80]

- N.B.: (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

- 1 Attempt any **FIVE** [20]
- a A low pass filter is a smoothing filter. Justify your answer. [4]
- b Differentiate among Butterworth high pass and low pass filtering [4]
- c Median filtering performs well in images corrupted by impulse noise. Justify your answer. [4]
- d What is the edge in the image? What different kinds of operators are used in detecting edges? [4]
- e Differentiate between image enhancement and image restoration [4]
- f What is a co-occurrence matrix? Illustrate it briefly. [4]
- 2 a Segment the following given image such that the difference between the maximum intensity and minimum intensity value is segmented region less than 18 using split and merge technique [10]

R =

10	9	30	4
7	6	33	37
54	52	54	53
55	57	56	58

- b Explain 2-D DFT with example and its application in frequency domain filtering. [10]
- 3 a A three bit image has the following grey level distribution. Determine grey level distribution for the output image using Histogram equalization procedure. [10]

Grey Level	G0	G1	G2	G3	G4	G5	G6	G7
Number of pixels	400	700	1350	2500	3000	1500	550	0

b Perform hit and miss transform on given image [10]

						1	
					1	1	1
						1	
	1	1	1				
	1	1	1				
		1					

B 1 =

0	1	0
1	1	1
0	1	0

B 2 =

1	0	1
0	0	0
1	0	1

4 a Derive contrast stretching function transformation function on given input image F. Obtain the output image R. [10]

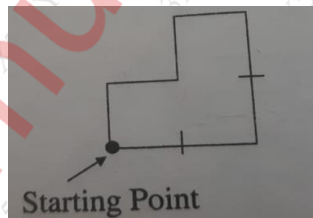
F =

7	12	2	3	4
10	15	1	6	7
12	4	6	15	12
8	2	7	15	2
11	13	3	3	5

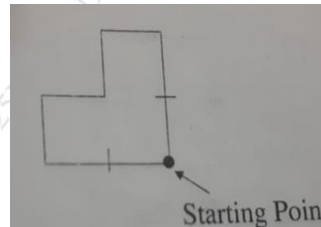
b Write short note on i) K means algorithm ii) Support Vector Machine [10]

5 a Find chain code, first difference and circular first difference using 4 code connectivity for the following images. Arrow shows the starting point for chain code [10]

a)



b)



b Write a short note on point processing. [10]

6 a Explain image degradation model and inverse filtering [10]

b Write short note on i) Fourier Transform of boundaries ii) Confusion Matrix [10]
