TE/SemV/CBCGS/IT/ND-18/12-12-2018

(3 hours) [80 marks]

Instructions:

1. **Question 1 is compulsory.**
2. **Answer any 3 from remaining 5 Questions.**
3. **Figures to the right indicate full marks.**
4. **Assume suitable data wherever necessary**

Q 1 (a) Given a 10 x 10 image, perform dilation using a structuring element 10

A=

0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	1	1	1	1	1	1	0	0
0	0	1	1	1	1	1	1	0	0
0	0	1	1	0	0	1	1	0	0
0	0	1	1	0	0	1	1	0	0
0	0	1	1	1	1	1	1	0	0
0	0	1	1	1	1	1	1	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

B=

1	1
1	1

Q 1 (b) Explain the types of gray level transformation used for image enhancement 10

Q2 (a) Explain Homomorphic filtering in detail. 10

Q2 (b) What is a Median filter, maximum filter and minimum filter ?When is the median filter not effective in noise removal 10

Q3 (a) Do histogram equalisation on the following image which has 8 discrete pixel levels (0 - 7), transforming it into a histogram equalised image also with 8 discrete grey levels in the range (0-7). 10

1 1 1 1 1 1 1 1
0 2 5 5 5 5 2 0
0 3 2 6 7 2 3 0
0 3 3 2 2 3 3 0
0 2 3 2 2 3 3 0
0 3 2 4 4 2 4 0
0 2 6 4 4 4 2 0
1 1 1 1 1 1 1 1

Q3 (b) Find the DFT of the image 10

f(x,y)=

1	2	3	2
2	3	4	3
1	2	3	2
2	3	4	3

Sketch the Magnitude and phase spectra

OR

Find the DCT of the above image

Q4 (a) Segment the given 8X8 image using Region splitting. Let the predicate be threshold<=3. Also draw the quad tree. 10

5	6	6	6	7	7	6	6
6	7	6	7	5	5	4	7
6	6	4	4	3	2	5	6
5	4	5	4	2	3	4	6
0	3	2	3	3	2	4	7
0	0	0	0	2	2	5	6
1	1	0	1	0	3	4	4
1	0	1	0	2	3	5	4

Q4 (b) What is the effect of repeatedly applying a contrast stretching and intensity slicing preserving background on a digital image 10

Q5 (a) Explain 4, 8 and m connectivity between pixels 10

Q5 (b) Histogram equalization for a digital image does not give a flat histogram explain 10

Q6 (a) How is line detected? Explain using the operators and also demonstrate by taking a set of points how edge linking can be done. 10

Q6 (b) Consider an 8- pixel line of gray-scale data, {12,10,13,13,10,13,57,54}, which has been uniformly quantized with 6-bit accuracy. Construct its 3-bit IGS code. 10