

1129
M.E. (Electronics and Communication Engineering)
Second Semester
ECE-1202: Digital Image Processing

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Attempt the following:-

- The higher order bit planes of an image are set to zero. What effect it would make on the histogram of the image?
- What is mach band effect? Why do you think it happens? What are its ill-effects?
- Describe the term 'Simultaneous Contrast'. Illustrate with examples.
- Explain the processes Hit-or-miss Transform in reference to image processing.
- Describe Histogram Specification for an image. (5x2)

UNIT – I

- How image is captured using a digital camera? How sampling rate and quantization effect are related to the quality of an image?
 - How an image is sharpened? Which filters are used for sharpening? (2x5)
- Consider the two image subsets, S_1 and S_2 , shown in the following figure. For $V = \{1\}$, determine whether these two subsets are (i) 4-adjacent, (ii) 8-adjacent or (iii) m-adjacent.

	S_1					S_2				
0	0	0	0	0	0	0	0	1	1	0
1	0	0	1	0	0	1	0	0	0	1
1	0	0	1	0	1	1	0	0	0	0
0	0	1	1	1	0	0	0	0	0	0
0	0	1	1	1	0	0	1	1	1	1

- Describe different type of noise models with their mathematical expressions. State their properties. (6,4)

P.T.O.

(2)

- IV. a) With the help of mathematical expressions, explain color slicing.
b) What are Wavelet Packets? What are their applications in image processing? (2x5)

UNIT – II

- V. a) What are different line detection techniques while segmenting an image?
b) What is Hough Transform? Explain how can one extract the features of lines and circle using Hough Transform? (2x5)
- VI. a) Define Image Registration. How does it work? Explain its importance in digital image processing.
b) Explain texturat segmentation with the help of an example. (2x5)
- VII. Write short notes on:-
a) Diagonal edge detection using Sobel Filter
b) Lossless predictive coding for image compression (2x5)

x-x-x