

BE (Sixth Semester)
Information Technology
Image Processing - 333672(33)
2015 - Summer Session , New Scheme

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Chapter 1

- 1 Explain first order and second order derivative and it's properties. 2
- 2 What is bit plane slicing? How an image can be enhanced using piecewise linear transformation functions? Explain in detail with example. 7
- 3 Perform image enhancement for the 8 x 8 image distribution shown in the following table-1. 7

r_k 0 1 2 3 4 5 6 7
 n_k 8 1 0 1 0 2 1 2 1 6 4 2

The specified image is given below :

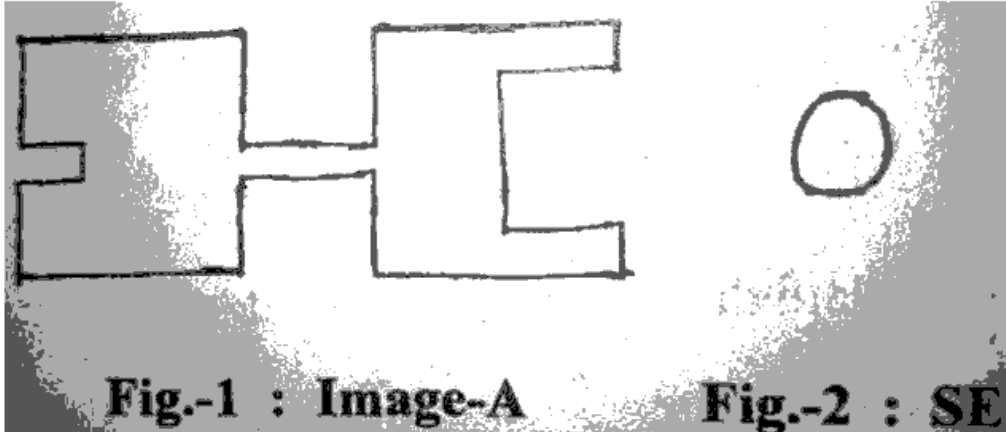
z_k 0 0 1 2 3 4 5 6 7
 n_k 0 0 0 2 0 2 0 1 6 8

- 4 What is importance of smoothing spatial filter? Explain smoothing spatial filter in detail. Differentiate smoothing spatial filter with sharpening. 7

Chapter 2

- 1 Explain basic steps of filtering in frequency domain. **CSVТУonline.com** 2
- 2 Why Mass-Hildreth edge detector is preferred over any other edge detector? Explain in detail. 7
- 3 Why is it necessary to perform edge linking and boundary detection? What are approaches to edge linking? Explain. 7
- 4 Write short notes on : 7
 - Thresholding
 - Region based segmentation

- 1 Point out some difference between dilation and erosion. 2
- 2 Explain algorithm of boundary extraction and region filling with example. 7
- 3 What is meant by 'dilation and erosion and increasing transformations'? How connected components is extracted from any image using morphology operations? Explain with example. 7
- 4 What are opening and closing operations of morphology? Explain opening and closing algorithm for following image-A(given in fig.1) and structure element (given in fig.2). 7



Chapter 4

- 1 How many type of redundancies are there in image compression? 2
- 2 A long sequence of symbols generated from a source is seen to have the following occurrences : 7

SymbolOccurrences

a_1	3003
a_2	996
a_3	2017
a_4	1487
a_5	2497

Answer the following questions :

- (i) Assign Huffman codes to the above symbols, following a convention that the group/symbol with higher probability is assigned a "0" and with lower probability is assigned a "1".
 - (ii) Calculate the entropy of the source.
 - (iii) Calculate the average code word length obtained from Huffman coding.
 - (iv) Calculate the coding efficiency.
- 3 Write down LZW compression code & compression ratio for string "ABABBABC ABABBA", if dictionary containing only 3 characters, with code given in table 7

Code String

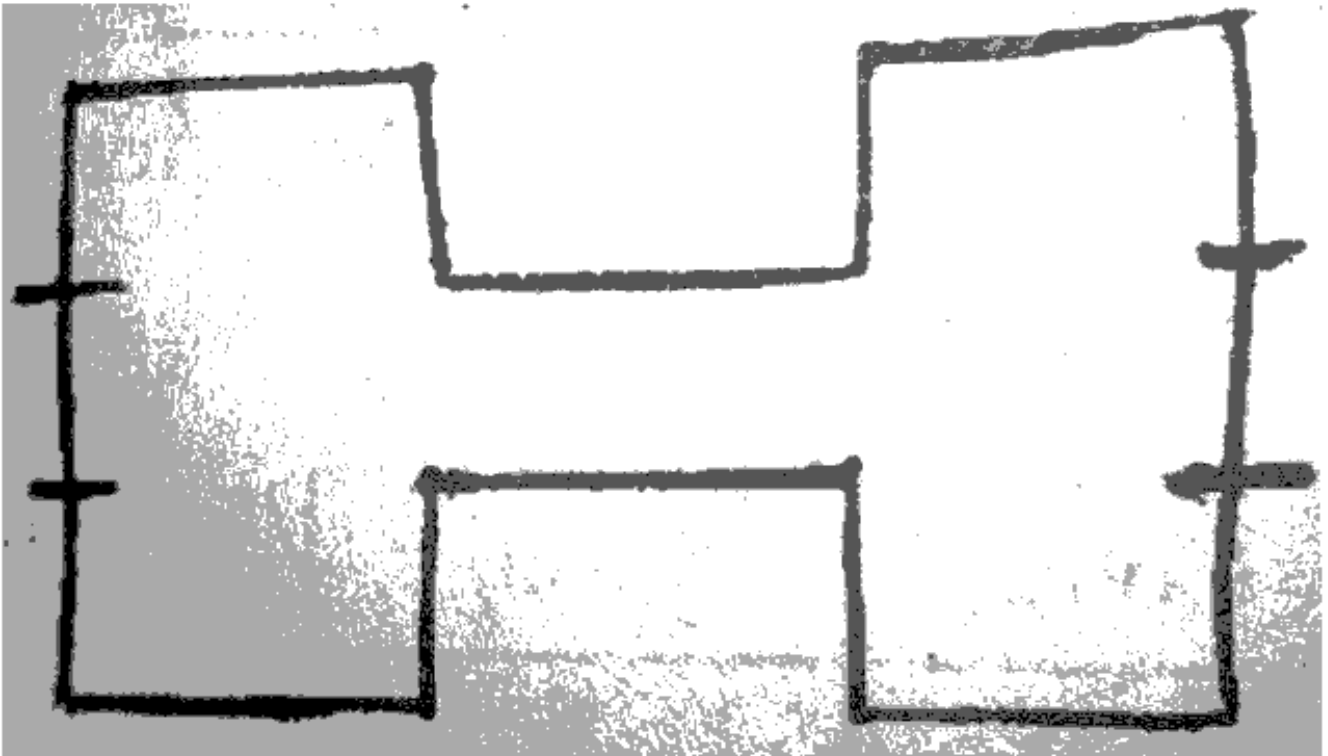
1	A
2	B
3	C

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- 4 Write short notes on following : 7
 - JPEG - 2000
 - Video Coding Standard

Chapter 5

- 1 Give a definition of perimeter of an object. What will be the object perimeter of following 8-dissectional chain code : **CSVТУonline.com** <788770312>. 2
- 2 Explain chain code, first order chain code and shape number. What is order of the shape number for the figure-3 shown below? Obtain chain code, first order chain code and shape number for the figure-3. 7



- 3 How statistical approach of texture description is dependent on standard deviation. Explain polygon approximation technique of image description. 7
- 4 Explain need of co-occurrence matrix. Write down steps to generate a co-occurrence matrix of image given in figures-4. 7

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516125

886812

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