

2012**MCA****5th SEMESTER EXAMINATION****IMAGE PROCESSING****PAPER—3503***Full Marks : 100**Time : 3 Hours**The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.**Illustrate the answers wherever necessary.**Answer any five questions.*

1. (a) Explain Fundamental steps in digital image processing with diagram. 10
- (b) Define image and image sampling. 4
2. Consider the image segment shown :
 - (a) Let $V = \{0, 1\}$ and compute the length of shortest 4-, 8- and m-path between p and q. If a particular path does not exist between these two points, explain why it is so.
 - (b) Repeat for $V = \{1, 2\}$

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

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3. (a) Describe any three basic Gray level transformation. 9
 (b) What do you mean by Gray level slicing and Bit plane slicing? 5
4. (a) Explain Histogram processing. What are the advantages of histogram processing? 6+3
 (b) Describe histogram equalization. 4
5. (a) Explain smoothing spatial filtering technique. What are the advantage of this type of filtering? 8+3
 (b) What are the use of the Laplacian for filtering? 3
6. (a) Describe Butterworth low pass filter and Gaussian low pass filter. 5+4
 (b) Explain Homomorphic filtering. 5
7. (a) Define Dilation and erosion with suitable diagrams.
 (b) Explain opening and closing for image morphological operation. (4+4+3+3)
8. (a) What do you mean by Image segmentation? 3
 (b) How can one can detect an edge within the image? 4
 (c) Explain different edge detector. 7

Internal Assessment

30