UNIVERSITY OF PUNE
[4364]-764
B. E. (Computer Engg)
Image Processing
(Elective-1)
(2008 Pattern)

[Total No. of Questions : 12] [Total No. of Printed Pages :2]

[Time : 3 Hours] [Max. Marks : 100]

Instructions :

  (1) Answer any 3 question from each section.

  *(2) Answers to the **two sections** should be written in **separate answer-books**.*

  (3) Neat diagram must be drawn wherever necessary.

  (4) Black figures to the right indicate full marks.

  (5) Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.

  (6) Assume suitable data, if necessary.

Section-I

Q.1

a) Explain the main Component of typical Image Processing with block diagrams. [8]

b) Write a note on Human Visual System. [8]

OR

Q.2

a) Describe Elements of matrix theory required any image processing application. [8]

b) Write short note on Digital imaging Hardware and Software. [8]

Q.3

a) Explain the method of contrast stretching using histogram equalization. [8]

b) Explain two dimensional sampling and Nyquist rate, aliasing effect and fold over frequencies in case of two dimensional sampling. [8]

Q.4

a) What is salt pepper noise? How we can remove it. [8]

b) Explain Hadamard and Walsh transformation. [8]

Q.5
a) With the help of appropriate mask explain the following [10]
   1) Point detection
   2) Line detection
   3) Edge detection
b) What is Hough transformation? How it can be used for boundary
   representation. [8]

OR

Q.6
a) State different methods of edge detection and explain one in details [8]
b) What is image segmentation? Discuss various approaches for image
   segmentation. [10]

Q.7
a) What is image restoration? How it differs from image enhancement. [8]
b) Write short note on [10]
   1) Lucy Richardson Filtering
   2) Blind Deconvolution

OR

Q.8
a) Explain methods of image degradation function for image restoration. [8]
b) Explain inverse filtering and Wiener filtering. State its difference [10]

Q.9
a) Explain the methods used for lossless image compression. [8]
b) With suitable example, explain how chain code can be used for boundary
   representation. How we can make this code rotation invariant? [8]

OR

Q.10
a) Describe the type of redundancies observed in an image. How we can
   remove these redundancies to achieve compression. [8]
b) Explain need and classification of object representation method. [8]

Q.11
a) Write a short note on [10]
   1) Medical Image Processing
   2) JPEG 2000
b) Explain Image Pyramids. [6]

OR

Q.12
a) Write short note [10]
   1) Principal Component Analysis
   2) Character Recognition application
b) Define WAVELET with properties. [6]