**P1411**

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# B.E. (Electronics)
# IMAGE PROCESSING AND MACHINE VISION
## (2008 Course) (404209) (Semester - II) (Elective - III)

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

1) *Answers to the two sections should be written in separate answer books.*
2) *Answer any three questions from each section.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right indicate full marks.*
5) *Use of Calculator is allowed.*
6) *Assume Suitable data if necessary.*

## SECTION - I

**Q1)** a) Explain the phenomena of brightness adaptation and simultaneous contrast. **[9]**

b) What are the steps in image digitization? Explain image quantization in detail. **[9]**

OR

**Q2)** a) With the help of block diagram explain the fundamental steps in Digital Image Processing. **[9]**

b) With the help of diagram explain the structure of human eye. Differentiate between photopic and scotopic vision. **[9]**

**Q3)** a) What is histogram matching? Give its application of advantages. **[8]**

b) Explain the basic relationship between the pixels. **[8]**

OR

**Q4)** a) Explain Image Histogram with the help of an example. What are the applications of Histogram. **[8]**

b) Explain how Image Enhancement can be done by power law transformation. **[8]**

**Q5)** a) What is the Image Segmentation? Explain Image Segmentation based on thresholding. **[8]**

b) How are discontinuities detected in an image? Explain Point detection and Line detection. **[8]**

OR

**Q6)** a) What is Hough Transform? What determines the accuracy of Hough transform? **[8]**

b) What is Adaptive thresholding? Explain the Otsu's method of Adaptive thresholding. **[8]**

## SECTION - II

**Q7)** a) Explain the Image Pyramid used for Multiresolution image analysis. **[9]**

b) What are the various data redundancies identified in an image? Explain in detail. **[9]**

OR

**Q8)** a) Explain RLC coding and arithmetic coding with examples. **[9]**

b) Calculate DCT of the given 2 × 2 matrix. Show that DCT transform preserves signal energy. **[9]**

**Q9)** a) What is Texture? Explain how it can be described with statistical parameters. **[8]**

b) What is boundary representation? Explain how chain codes are used for boundary representation. **[8]**

OR

**Q10)** a) Explain any two descriptors used for boundary description. **[8]**

b) With the help of examples describe shape number for shapes of order 4,6 and 8. **[8]**

**Q11)** a) Explain support vector approach for pattern recognition. **[8]**

b) Give the basic model of Image Degradation/Restoration Process. **[8]**

OR

**Q12)** a) Explain character recognition using image processing. **[8]**

b) Explain one spatial filter for restoration in the presence of noise. **[8]**

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