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06CS/IS762

Seventh Semester B.E. Degree Examination, June/July 2011
Digital Image Processing

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions selecting
at least TWO questions from each part.**

PART – A

- 1 a. Define an image, explain the steps involved in image digitization. (06 Marks)
b. With an example, explain and write distance transform algorithm. (04 Marks)
c. Define noise. Discuss types of noise. Write an algorithm for generation of additive zero mean Gaussian noise. (10 Marks)
- 2 a. Explain the steps involved in geometric transformation. (10 Marks)
b. Write an algorithm for image averaging using rotating mask for noise suppression. (05 Marks)
c. Write an canny edge detector algorithm. Discuss its significance. (05 Marks)
- 3 a. Explain image segmentation using optimal thresholding method. (10 Marks)
b. Write an algorithm for curve detection using Hough transform. (05 Marks)
c. Explain border detection using dynamic programming. (05 Marks)
- 4 a. What is region merging – write an algorithm for region merging via boundary melting. (05 Marks)
b. Explain region based segmentation using quad tree method. (05 Marks)
c. Define matching. Explain match based segmentation and its control strategies. (10 Marks)

PART – B

- 5 a. Explain image enhancement using
i) Histogram equalization (05 Marks)
ii) Contrast stretching. (05 Marks)
b. Explain image sharpening using spatial domain method. (05 Marks)
c. Explain low, high and band pass filtering with respect to frequency domain method. (10 Marks)
- 6 a. Define image compression. Explain types of redundancy. (05 Marks)
b. With a neat block diagram explain lossless predictive coding. (05 Marks)
c. Write an algorithm for Huffman code and construct a code word for the word "COMMITTEE". (10 Marks)
- 7 a. Write an algorithm for region identification using 4 N and 8 N. (04 Marks)
b. Explain region based shape representation and description. (08 Marks)
c. Describe contour based shape representation with respect to
i) Chain code
ii) Border representation. (08 Marks)
- 8 a. What is morphological operation? Explain morphological operations
i) Dilation and erosion
ii) Opening and closing
iii) Hit or miss transformation. (10 Marks)
b. What do you mean by skeletonization? Explain sequential thinning by structural elements. (06 Marks)
c. Explain morphological segmentation and watershed. (04 Marks)
