Question Paper Code: 4052478

M.E. / M.Tech. DEGREE EXAMINATIONS, NOV/ DEC 2024
Second Semester
Computer Science and Engineering
P23CSE02 – DIGITAL IMAGE PROCESSING
(Regulation 2023)

Time: Three Hours   Maximum: 100 Marks

Answer ALL questions

PART – A   (10 x 2 = 20 Marks)

1.   When is fine sampling and course sampling used?

2.   Mention difference between spatial and frequency domain.

3.   Draw the model of image degradation process.

4.   Give the difference between enhancement and restoration.

5.   Discuss the role of thresholding in image segmentation.

6.   How can motion be used to enhance image segmentation?

7.   Write about Error free Compression.

8.   Define image morphology and explain its significance in image processing.

9.   How is image segmented using thresholding?

10.   What is meant by the detection of discontinuities in an image, and why is it important?

PART – B   (5 x 16 = 80 Marks)

11. (a) What are the elements (components) of digital image processing system? Explain the function of each element in detail. (16)

(OR)

(b) Discuss the different image sharpening spatial filters and also explain any application of sharpening filter in brief. (16)

12. (a) Explain the Noise model for image restoration. (16)

(OR)

(b) What is a color model? What are its types? Explain RGB and HSI models with necessary diagrams. (16)

13. (a) Explain the concept of edge linking and its importance in boundary detection. Discuss algorithms that enhance edge linking for continuous boundary detection, such as the Hough Transform. (16)

(OR)

(b) Describe regional descriptors such as moments, centroids, and area. How do these descriptors help in identifying objects in an image? (16)

14. (a) Discuss the concept of lossy predictive coding in image compression. How does it work, and what are its advantages and disadvantages compared to error-free compression? (16)

(OR)

(b) Describe the hit-or-miss transformation in detail. How does this transformation contribute to shape detection and pattern recognition in binary images? (16)

15. (a) Explain region-based segmentation techniques. Discuss region growing, region splitting and merging with examples of their application. (16)

(OR)

(b) Describe the structure and function of a neural network for object recognition. How is a neural network trained to recognize patterns in an image? (16)

-----------xxxx----------