C

B.E. / B.Tech. DEGREE EXAMINATION, MAY 2024

Open elective

Civil Engineering

19UEC954– FUNDAMENTAL OF DIGITAL IMAGE PROCESSING

(Common to CSE, EEE, Mechanical, IT, Chemical, Agriculture and Biomedical Engineering)

(Regulations 2019)

Duration: Three hours   Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5Marks)

1. Number of bits to store image is denoted by the formula   CO1- U

    (a) b=NxK   (b) b=MxN   (c) b=MxNxK   (d) b=MxK

2. _____ enhance Image Differentiation?   CO1- U

    (a) Pixel Density   (b) Contours   (c) Edges   (d) None of the mentioned

3. Mean filter reduce noise using   CO1- U

    (a) Sharpening   (b) Blurring   (c) Restoration   (d) Acquisition

4. For line detection _____ mask is used   CO1- U

    (a) Gaussian   (b)Laplacian   (c) Ideal   (d) Butterworth

5. Reflection and translation of image objects are based on   CO1- U

    (a)Pixels   (b) Frames   (c)Structuring Elements   (d) Coordinates

PART – B (5 x 3= 15Marks)

6. Find the number of bits required to store a 256 X 256 image with 32 gray   CO2- App
    levels?

7. Mention the advantage of histogram equalization over histogram processing   CO1- U

8. What are the two approaches for blind image restoration?   CO1- U

9. How is the line detected? Define it.   CO1- U

10. What are the advantages of morphological image processing   CO1- U

PART – C (5 x 16= 80 Marks)

11. (a) (i) Explain about a simple image formation model.   CO1-U   (8)

      (ii) Explain how analog signal is converted into digital by   CO1-U   (8) sampling and quantization.

Or

   (b) Describe the elements of a digital image processing system with a   CO1-U   (16) diagram.

12. (a) How do you enhance a monochrome image by histogram and   CO3-Ana   (16) histogram equalization?. Explain with example.

Or

   (b) Analyze the results of various image sharpening filters for an   CO3-Ana   (16) image and discuss its results.

13. (a) Discuss the mean filters and order statistics filter in image   CO1-U   (16) restoration in detail.

Or

   (b) Explain how the degradation function is estimated with three   CO1-U   (16) principal methods and give the details of the process.

14. (a) Explain the region based image segmentation algorithms in image   CO1-U   (16) processing

Or

   (b) Explain Hough transform for edge detection in digital image   CO1-U   (16) processing.

15. (a) Explain the morphological transform that uses morphological   CO1-U   (16) erosion operation for detecting a given pattern in an image.

Or

   (b) Explain about region filling for morphological processing with a   CO1-U   (16) suitable example

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