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**Question Paper Code: 97403**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2022

Seventh Semester

Electronics and Communication Engineering

19UEC703- Image Processing and Machine Learning

(Regulation 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Which surface best obeys the laws of reflection? CO1- U  
(a) Specular Surface (b) Lambertian Surface (c) Normal surface (d) All of the above.
2. A grey level image pixel is represented by \_\_\_\_\_ bit. CO1- U  
(a) One (b) Two (c) Four (d) Eight
3. Canny edge detection algorithm is based on, CO1- U  
(a) Ideal model (b) step edge (c) real model (d) smoothing model
4. For the total number of 1650 test patterns, only the 65 are correctly CO2- App  
recognized test patterns, calculate the accuracy rate.  
(a) 38.25 (b) 25.38 (c) 46.38 (d) 38.46
5. \_\_\_\_\_ methods are used to group data samples into different classes CO3- R  
(a) Clustering (b) Segmentation (c) Classification (d) Pattern recognition

PART – B (5 x 3= 15 Marks)

6. Differentiate computer vision and computer graphics CO1- U
7. State the concept of image transform. CO1- U
8. What is segmentation? CO1- U
9. Write short notes on Recurrent network. CO1- U
10. Draw a decision tree to implement one simple real time example. CO1- U

PART – C (5 x 16= 80Marks)

11. (a) Illustrate the concept of radiometry using thin lens. CO1- U (16)

Or

(b) Derive the expression for the image formation process in various projections. CO1- U (16)

12. (a) Obtain the Discrete Fourier Transform for the given vectors CO2- App (16)  
Input image matrix= $[0 \ 0 \ ;255 \ 255]$   $[2 \times 2]$  matrix. Also analyze how the Fourier transform is used if the image is rotated or translated.

Or

(b) Apply contrast stretching to improve the dynamic range of the given image CO2- App (16)

3	7	8	2
2	4	3	5
5	0	2	1
4	3	2	1

13. (a) What do you understand by dilation and erosion in morphological operation? Explain in detail. CO1- U (16)

Or

(b) Explain in detail how an image is segmented using region splitting and merging algorithm and how the segmented object is represented by chain codes. CO1- U (16)

14. (a) Explain the various steps in pattern recognition. CO1- U (16)

Or

(b) Explain in details about the different types of classifier. CO1- U (16)

15. (a) Describe the Major challenges in medical image segmentation CO1- U (16)

Or

(b) Explain in detail about Supervised clustering. CO1- U (16)