Reg. No. : | | | | | | | | | | | | |

Question Paper Code: U2301

M.E. DEGREE EXAMINATION, APRIL / MAY 2025

Second Semester

Computer Science and Engineering

21PCS201- IMAGE PROCESSING AND ANALYSIS

(Regulations 2021)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. What is the size of the image, if its pixel resolution is 1024X1024 and bpp=8? CO2- App
2. Write short notes on neighbors of a pixel CO1- U
3. Consider the following 2-bit image of size 5X5: Find the mean(Average Intensity) value of r? CO2- App

0	0	1	1	2
1	2	3	0	1
3	3	2	2	0
2	3	1	0	0
1	1	3	2	2

4. Write a matlab code for obtaining a histogram of any image. CO2- App
5. Formulate how the derivatives are obtained in edge detection CO2- App
6. Identify the detection of discontinuity in an image using segmentation CO1- U
7. Calculate values of a standard 8.5” by 11” sheet of paper scanned at 100 samples per inch (dpi) and quantized to two gray levels (binary image) would require more than 100k bytes to represent CO2- App
8. What is the best choice for compression: Lossless or lossy? Justify your answer CO1- U
9. Classify the different methods of image representation CO1- U
10. Draw the medial axis of an ellipse. CO2- App

PART – B (5 x 16= 80 Marks)

11. (a) Use the following components R= 24, G=98 and B=118 are convert into HSI component, CMY,YIQ — CO2- App — (16)

OR

(b) Let V = {1, 2} and compute the lengths of the shortest 4-, 8-, and m-path between p and q. If a particular path does not exist between these points, explain why. — CO2- App — (16)

3	1	2	1(q)
2	2	0	2
1	2	1	1
1 (p)	0	1	2

12. (a) Equalize the Given Histogram — CO2- App — (16)

Gray Levels	0	1	2	3	4	5	6	7
No of Pixels	790	1023	850	656	329	245	122	81

OR

(b) Derive the Histogram Equalization — CO2- App — (16)

$$S_k = \sum_{j=o}^{k} p_r(rj)$$

13. (a) Given the following set of Points use Hough Transform to join these points A(1,4) B(2,3) C(3,1) D(4,1), E(5,0) — CO2- App — (16)

OR

(b) Compute the following operations are performed using Region Based Segmentation on the given image i) Region Growing ii)Region Splitting iii) Region Merging — CO2- App — (16)

5	6	6	7	7	7	6	6
6	7	6	7	5	5	4	7
6	6	4	4	3	2	5	6
5	7	5	4	2	3	4	6
0	3	2	3	3	2	4	7
0	0	0	0	2	2	5	6
1	1	0	1	0	3	4	4
1	0	1	0	2	3	5	4

14.	(a)	Consider image size: 10x10(5 Bit Image) ; Frequency a1=10, a2=40, a3=6, a4=10, a5=4, a6=30. Decode the encoded string 010100111100	CO2- App	(16)
		OR		
	(b)	Compute the following LZW encoding sequence as ababbabcababba	CO2- App	(16)
15.	(a)	(i) Classify the Regional descriptors (ii) Examine the regional descriptors with basic diagrammatic representations.	CO2- App	(16)
		OR		
	(b)	Develop the Bayes classifier for Gaussian Pattern classes for object recognition.	CO2- App	(16)