



PRESIDENCY UNIVERSITY

BENGALURU

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Make Up Examinations – December 2025

Date: 26 – 12- 2025

Time: 1.00pm to 04.00pm

School: SOCSE	Program: CSE		
Course Code: CSE3081	Course Name: Digital image processing		
Semester: MK	Max Marks: 100	Weightage: 50%	

CO - Levels	C01	C02	C03	C04	C05
Marks	38	36	62	44	

Instructions:

- (i) Read all questions carefully and answer accordingly.
- (ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks.

10Q x 2M=20M

1	Define edge detection.	2 Marks	L1	C02
2	Explain image quantization.	2 Marks	L2	C01
3	Define aliasing.	2 Marks	L1	C01
4	Calculate the number of bits required to store a 512x512 grayscale image with 8-bit depth.	2 Marks	L3	C02
5	Explain aliasing	2 Marks	L1	C01
6	List any two image enhancement techniques	2 Marks	L1	C02
7	Explain the concept of spatial domain filtering	2 Marks	L2	C03
8	List the image enhancement techniques to improve a low-contrast	2 Marks	L1	C04
9	Explain the importance of filtering in image processing.	2 Marks	L2	C01
10	List the applications of image processing.	2 Marks	L2	C04

Part B

Answer the Questions

Total 80 Marks.

11.	a.	Explain the fundamental steps involved in digital image	10 Marks	L2	C01
		<p>Given Data: 3x3 Image Matrix:</p>			
	b.	$I = \begin{bmatrix} 10 & 20 & 10 \\ 20 & 50 & 20 \\ 10 & 20 & 10 \end{bmatrix}$	10 Marks	L3	C02
		Gaussian Kernel:			

Or

12.	a.	Compare edge-based and region-based segmentation	10 Marks	L2	C03
	b.	Explain the importance of image processing in healthcare	10 Marks	L2	C04

13.	a.	Explain the significance of morphological operations.	10 Marks	L2	C01
	b.	Compare different machine learning models for image classification.	10 Marks	L2	C03

Or

14.	a.	Describe the EM algorithm in image segmentation.	10 Marks	L1	C04
	b.	Explain the commands in MATLAB to do the various operators used in image processing.	10 Marks	L1	C04

15.	a.	Explain the principles of histogram equalization.	10 Marks	L2	C01
	b.	<p>An 8-bit grayscale image has pixel intensities: $I = \{20,35,45,50,60,80,100,120\}$ Perform 4-level quantization (using 4 bins).</p>	10 Marks	L3	C02

Or

16.	a.	Describe feature extraction methods.	10 Marks	L2	C03
		Perform connected component labeling on the binary image:			
	b.	$I = \begin{bmatrix} 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 \\ 0 & 0 & 1 & 1 \\ 0 & 1 & 1 & 0 \end{bmatrix}$	10 Marks	L3	C02

17.	a.	Summarize the limitations of image compression techniques.	10 Marks	L2	C03
	b.	Suppose a simple image has pixel intensities: $I = \{100,150,200,220,240\}$	10 Marks	L3	C04

<p>Apply the k-means segmentation (4 iterations) to do the clustering with the following assumptions Number of clusters k=2 Initial centroids: C1=150, C2=240</p>			
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Or

18.	a.	Explain image compression techniques.	10 Marks	L2	C03
		Perform dilation and erosion on a binary image:			
		$I = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$			
	b.	Structuring Element:	10 Marks	L3	C03
		$S = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$			

******* BEST WISHES *******