Code No.: R22EC633OE

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CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
III–B.TECH–II–Semester End Examinations (Regular) - June- 2025
DIGITAL IMAGE PROCESSING
(CSM)

[Time: 3 Hours] **[Max. Marks: 60]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 10 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A **(10 Marks)**

1. a)	Write two properties of the 2D Fourier Transform?	[1M]
b)	Define spatial resolution.	[1M]
c)	Name two linear point processing techniques.	[1M]
d)	Define histogram manipulation.	[1M]
e)	What is the purpose of low pass filters in enhancement?	[1M]
f)	Explain the term "constrained least squares".	[1M]
g)	What is meant by hit-or-miss transformation?	[1M]
h)	List two applications of morphological operations.	[1M]
i)	How is fidelity measured in image compression?	[1M]
j)	Define redundancy in the context of image data.	[1M]

PART-B **(50 Marks)**

2.a)	Explain the concept of image quantization.	[6M]
b)	Compare Walsh and Haar Transforms.	[4M]
	OR	
3.a)	Write about the properties of the Discrete Cosine Transform.	[4M]
b)	Discuss Hotelling Transform and its use in data reduction.	[6M]
4.a)	Explain point processing techniques used in image enhancement.	[6M]
b)	Discuss nonlinear gray level transformations with examples.	[4M]
	OR	
5.a)	Describe the median filter and its application.	[4M]
b)	Explain how frequency domain filters are used for sharpening.	[6M]
6.a)	Describe the algebraic approach to restoration.	[4M]
b)	Explain the working and advantages of interactive restoration.	[6M]
	OR	
7.a)	Discuss least mean square filtering with suitable diagrams.	[4M]
b)	Explain how constrained least squares can restore degraded images.	[6M]
8.a)	Explain edge linking and boundary detection techniques.	[4M]
b)	Discuss region-oriented segmentation.	[6M]
	OR	
9.a)	Define dilation and erosion. Provide examples.	[4M]
b)	Describe structuring element decomposition and its significance.	[6M]
10.a)	Explain error-free compression and its methods.	[4M]
b)	Compare JPEG and JPEG 2000.	[6M]
	OR	
11.a)	Describe lossy predictive coding and transform coding.	[6M]
b)	Discuss the importance of fidelity criteria in image compression.	[4M]

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