



Paper ID : 261569

Printed Page: 1 of 1

Subject Code:BCDS061

Roll No:

BTECH

(SEM. VI) THEORY EXAMINATION 2025-26

IMAGE ANALYTICS

TIME: 3 HRS

M.MARKS: 70

Note: Attempt all Sections. In case of any missing data; choose suitably.

SECTION A

1. Attempt all questions in brief.

02 x 7 = 14

Q no.	Question	CO	Level
a.	What are the fundamental steps in an image processing system?	1	K1
b.	Write four difference between smoothing and sharpening filters.	1	K2
c.	Define morphological image processing.	2	K1
d.	Define thinning and thickening.	3	K1
e.	What is meant by full color image processing?	1	K1
f.	What is region splitting and merging?	4	K1
g.	Define texture descriptors.	5	K1

SECTION B

2. Attempt any three of the following:

07 x 3 = 21

a.	Explain the role of filters in noise reduction and edge enhancement.	1	K2
b.	Explain advantages and limitations of color-based vs grayscale segmentation.	3	K2
c.	Discuss applications of Scale-Invariant Feature Transform (SIFT) in image matching and recognition.	4	K2
d.	Discuss the limitations of Euclidean distance classifier and suggest improvements.	3	K3
e.	Discuss how class-conditional probability density functions affect Bayes classifier performance.	5	K3

SECTION C

3. Attempt any one part of the following:

07 x 1 = 07

a.	Explain the effect of different structuring elements on morphological operations.	2	K2
b.	Discuss different types of noise in color images and their removal.	1	K3

4. Attempt any one part of the following:

07 x 1 = 07

a.	Discuss applications of morphology in noise removal and shape analysis.	2	K3
b.	Explain multilayer feedforward neural networks with backpropagation.	5	K2

5. Attempt any one part of the following:

07 x 1 = 07

a.	Describe architecture and working of deep convolutional neural networks (CNNs).	5	K3
b.	Compare SIFT feature matching vs correlation-based matching in terms of robustness.	4	K3

6. Attempt any one part of the following:

07 x 1 = 07

a.	Describe color fundamentals and different color models (RGB, CMY, HSV).	3	K2
b.	Explain the complete pattern recognition pipeline from feature extraction to classification.	4	K3

7. Attempt any one part of the following:

07 x 1 = 07

a.	Derive and explain image negative transformation and its applications.	1	K3
b.	Explain advantages of Fourier descriptors over shape numbers.	4	K3