Printed Page:- 03 Subject Code:- ACSAI0522

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

B.Tech

SEM: V - THEORY EXAMINATION (2024 - 2025)

Subject: Image Processing & Pattern Recognition

Time: 3 Hours Max. Marks: 100

General Instructions:

IMP: *Verify that you have received the question paper with the correct course, code, branch etc.*

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A 20

1. Attempt all parts:-

1-a. ___vision is called photonic vision.(CO1) 1

(a) Cone

(b) fovea

(c) retina

(d) focal length

1-b. Digitizer is a device for converting the output of the physical sensing device into ___.(CO1) 1

(a) analog form

(b) image

(c) digital form

(d) all of the above

1-c. In spatial domain, which of the following operation is done on the pixels in sharpening the image?(CO2) 1

(a) Integration

(b) Average

(c) Median

(d) Differentiation

1-d. At which of the following scenarios averaging filters is/are used?(CO2) 1

(a) In the reduction of irrelevant details in an image

(b) For smoothing of false contours

(c) For noise reductions

(d) All of the above

1-e. Laplacian Images need:(CO4) 1

(a) a. Contraction

(b) b. Expansion

(c) c. Scaling

(d) d. Enhancement

1-f. If R is the entire region of the image then union of all segmented parts should be equal to(CO4) 1

(a) a. R

(b) b. R’

(c) c. Rn

(d) d. Ri

1-g. In image segmentation, which of the following algorithms uses pixel intensity values to group similar pixels together?(CO5) 1

(a) SVM

(b) Random Forest

(c) K- Means clustering

(d) AI

1-h. In grayscale images, pixel intensity ranges from:(CO5) 1

(a) 0to 50

(b) 0 to 100

(c) 0 to 1000

(d) 0 to 255

1-i. The visible spectrum ranges_____(CO5) 1

(a) 300-600 nm

(b) 400-700 nm

(c) 500-800 nm

(d) 600-900 nm

1-j. RGB color system is based upon(CO3) 1

(a) Cartesian plane

(b) Cartesian system

(c) Cartesian plane system

(d) Cartesian coordinate system

2. Attempt all parts:-

2.a. List the two applications of Image processing.(CO1) 2

2.b. Define Gaussian Smoothing.(CO2) 2

2.c.	Discuss the difference between grey level and color image.(CO5)	2
2.d.	Discuss about three color channels in Image(CO5).	2
2.e.	Explain the Spatial domain and Frequency domain. (CO3)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Discuss the following term: i) Adjancency ii) Connectivity iii) Neighbors of Pixels(CO1)	6
3-b.	Define image digitizer? Write down the characterstics of an image digitizer.(CO1)	6
3-c.	Differntiate between Histogram Specification and Equalization(CO2)	6
3-d.	Discuss the concept of LOG in detail.(CO2)	6
3.e.	Explain grey level co-occurrence matrix in image processing?(CO3)	6
3.f.	Enlist the applications of image transformation(CO4).	6
3.g.	Differentiate between Image enhancement and Segmentation.(CO5)	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	Discuss the advantages ,disadvantages and applications of different types of sensors in image processing (CO1)	10
4-b.	Explain the following (a) Convolution (b) Correlation(CO1)	10

5. Answer any one of the following:-

5-a.	Compare the various image transformation technique.(CO2)	10
5-b.	Discuss the various Gray Level Transformation Techniques.(CO2)	10

6. Answer any one of the following:-

6-a.	Discuss the difference between region and boundary in image processing?(CO4)	10
6-b.	Explain the techniques of region representation in image processing?(CO3)	10

7. Answer any one of the following:-

7-a.	An object is placed with respect to origin on (2,1). Now move the object away from the origin by 2 steps in X direction and 3 steps in Y direction. What would be the new coordinate after performing Translation and Scaling (CO5)	10
7-b.	Discuss the following : 1) Shearing 2) Reflection(C05) .	10

8. Answer any one of the following:-

8-a.	Explain the implementation steps for reading a grey scale image and convert into RGB model.(CO3)	10
8-b.	Discuss the following termenologies:1) Segmentation 2)Dialation 3) Hit or Miss Transform 4)RGB Model 5)Logical Operators(CO5)	10