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: III - THEORY EXAMINATION (2023 - 2024)

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. 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-b. Major uses of imaging based on ___ include nuclear medicine and astronomical observations.(CO1) 1

(a) alpha rays

(b) beta rays

(c) gamma-ray

(d) laser rays

1-c. In Which filter(s) used to find the brightest point in the image?(CO2) 1

(a) Median filter

(b) Max filter

(c) Mean filter

(d) All of the above

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. Image segmentation is based on?(CO3) 1

(a) Morphology
(b) Set theory
(c) Extraction
(d) Recognition

1-f. Tell What is the process of breaking an image into groups?(CO3) 1

(a) Edge detection
(b) Smoothing
(c) Segmentation
(d) None of the mentioned

1-g. Picture is short term for(CO4) 1

(a) Pixel is the elements of an analog image
(b) The brightness of a pixel in an image
(c) The size of a pixel in an image
(d) Picture element

1-h. LOG stands for (CO4) 1

(a) Laplacian of Gaussian
(b) Length of Gaussian
(c) Length of Gray level
(d) None of them

1-i. HSI color model stands for(CO5) 1

(a) hue, system, intensity
(b) hue, saturation, intensity
(c) high, saturation, intensity
(d) high, system, intensity

1-j. RGB colors have range(CO5) 1

(a) [0,1]
(b) [1,2]
(c) [1,0]
(d) [0,255]

2. Attempt all parts:-

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

2.b. Explain the two categories of image enhancement(CO2) 2

2.c. Discuss the gray level in image processing.(CO3) 2

2.d.	What do you understand by geometric transformation.(CO4)	2
2.e.	Define the CMYK color model in brief.(CO5)	2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Define digital image? Explain the representation of digital images.(CO1)	6
3-b.	Explain the components of image processing system? (CO1)	6
3-c.	Specify the need for image enhancement.(CO2)	6
3-d.	Discuss the concept of Filtering with its advantages and disadvantages.(CO2)	6
3.e.	Discuss the difference between grey level image and color image? What are benefits of using gray level image(CO3)	6
3.f.	Enlist the applications of image transformation(CO4).	6
3.g.	Explain About RGB model in detail.(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 process of Image acquistions.(CO1)	10

5. Answer any one of the following:-

5-a.	Discuss the Follwing : 1)Ideal High Pass Filter 2) Butterworth High Pass Filter 3)Gaussian Filter(CO2)	10
5-b.	Discuss the advantages and disadvantages of Frequency domain and why it is used widely in image enhancement(CO2)	10

6. Answer any one of the following:-

6-a.	Explain the concept of edge detection.Discuss the categories of edge detection operators.(CO3)	10
6-b.	Discuss the concept of Image Segmentation and its types in detail.(CO3)	10

7. Answer any one of the following:-

7-a.	Differentiate between the Local mapping and Global mapping model(CO4).	10
7-b.	Explain the Following : 1) Translation 2) Scaling(CO4).	10

8. Answer any one of the following:-

8-a.	Discuss the following termenologies:1) Segmentation 2)Dialation 3) Hit or Miss Transform 4)RGB Model 5)Logical Operators(CO5)	10
8-b.	Explain the various Color models used in Image processing.(CO5)	10