Printed Page:- Subject Code:- AMTCSE0213

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

M.Tech.

SEM: II - THEORY EXAMINATION (2021 - 2022)

Subject: Digital Image Processing

Time: 3 Hours Max. Marks: 70

General Instructions:

1. The question paper comprises three sections, A, B, and C. You are expected to answer them as directed.
2. Section A - Question No- 1 is 1 marker & Question No- 2 carries 2 marks each.
3. Section B - Question No-3 is based on external choice carrying 4 marks each.
4. Section C - Questions No. 4-8 are within unit choice questions carrying 7 marks each.
5. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION A 15

1. Attempt all parts:-

1-a. Digitizing the coordinate values is called _____ . (CO1) 1

(a) Quantization

(b) Sampling

(c) Zooming

(d) Shrinking

1 What is the smallest possible value of the gradient image? (CO2) 1

(a) 1

(b) 0

(c) e

(d) -e

1 What is the Euler number of a region with polygonal network containing V,Q and F as the number of vertices, edges and faces respectively? (CO3) 1

(a) V+Q+F

(b) V-Q+F

(c) V+Q-F

(d) V-Q-F

1-d.	Hit-or-miss transformation is used for shape ? (CO4)	1

(a) removal

(b) detection

(c) compression

(d) decompression

1	Hue and saturation, both together produce? (CO5)	1

(a) brightness

(b) transitivity

(c) chromaticity

(d) reflectivity

2. Attempt all parts:-

2.a.	Define sampling and quantization?(CO1)	2
2.b.	What is image negative?(CO2)	2
2.c.	Give the Properties of One-dimensional DFT? (CO3)	2
2.d.	Define Erosion? (CO4)	2
2.e.	Define encoder ? (CO5)	2

SECTION B 20

3. Answer any five of the following:-

3	Write down the steps involved in converting an image into digital image for image processing in detail ? (CO1)	4
3	Distinguish between image enhancement and image restoration. Give an example for each ? (CO1)	4
3	Explain the types of grey level transformation used for image enhancement? (CO2)	4

1. Linear (Negative and Identity)
2. Logarithmic (Log and Inverse Log)
3. Power law (nth root and nth power)

3	Explain Why the image is subjected to wiener filtering?(CO2)	4
3.e.	Describe Fast Fourier Transform ? (CO3)	4
3.f.	Explain hit and miss transform in digital image processing ? (CO4)	4
3.g.	Explain CMY color mode? (CO5)	4

SECTION C 35

4. Answer any one of the following:-

4	With neat block diagram explain the fundamental steps involved in digital image processing? (CO1)	7
4	Explain the concept of sampling and Quantization. Also explain the importance of digitization in the digital image processing? (CO1)	7

5. Answer any one of the following:-

5	Explain image enhancement in the frequency domain? (CO2) 1. Smoothing filters. 2. Sharpening filters.	7
5	Briefly discuss about Histogram specification and equalization techniques ? (CO2)	7

6. Answer any one of the following:-

6-a.	Differentiate between walsh transform and K-L transform ? (CO3)	7
6-b.	Explain boundary descriptor with suitable equations? (CO3)	7

7. Answer any one of the following:-

7-a.	What is dilation and erosion. Write the Properties of dilation and erosion? (CO4)	7
7-b.	Explain the Region-Based and Contour based Image Segmentation ? (CO4)	7

8. Answer any one of the following:-

8-a.	Explain Huffman coding with an example?(CO5)	7
8-b.	Explain the RGB color model in detail ? (CO5)	7