

Sec - A

Q How can a digital image be represented?
Explain the process of analog to digital conversion.

Q What is image degradation and restoration?
Explain them with an example.

Q Explain image sensing and acquisition using single sensor and line sensor.

Q How can image sampling and Quantization be illustrated with an example.

Q Compare smoothing and sharpening filter used in image enhancement.

Q Explain noise models along with equations in image restoration.

Q Illustrate Image Sampling and Quantization with an example.

Q Briefly explain contrast stretching and bit plane slicing with example.

Q Compare smoothing and sharpening filters used in image enhancement.

Q Explain about image compression model.

Q What is linear and position invariant degradation.

Q Write about linking edge points.

Q Explain the concepts of image sampling and Quantization in digital image.

Q Explain the log transformation and power law transformation used for spatial image.

Q What is digital image processing? Explain the application of image processing.

Q Explain the role of low-pass filters in smoothing an image in the frequency domain. How does it affect image details.

Q How is digital image represented? Explain the steps involved in the analog to digital conversion (ADC) process.

Q Define histogram. Explain the concept of histogram processing in the given table. Find the transformed intensity values after equalization.

3	2	2	3	4
4	3	2	5	4
3	3	1	3	1
3	4	2	3	1
2	1	2	2	2

Q With a block diagram explain the fundamental steps involved in digital image processing.

Q Explain the sharpening filters in spatial domain for image enhancement.

Q Differentiate between lossless and lossy compression and explain transform coding system with a neat diagram.

Q Explain the different types of distances used in digital image processing with suitable examples. Find the following:-

Euclidean distance (D_1)

Cityblock distance (D_2)

Chessboard distance (D_3)

Calculate these distances for points $p = (3, 4)$ and $q = (7, 1)$ and provide the answer in form (D_1, D_2, D_3)

Q Explain the fundamental steps involved in digital image processing with the help of a block diagram.

Q What do you understand by image degradation and image transformation restoration. Explain both the concepts with a suitable example.

Q Explain the different types of distances used in digital image processing with suitable example. Discuss the following distances matrices:- Euclidean distance, City-block distance, Chessboard distance. Additionally Calculate these distances for the points $p = (2, 6)$ and $q = (8, 3)$ and provide the answers from (D_1, D_2, D_3).

Q Explain in brief types of smoothing filters and sharpening filters.

Sec-C

Q.1 Briefly explain the following

- a) Neighbours of a pixel.
- b) Distance function.
- c) Euclidean distance
- d) City block and Checkerboard distance.

b) Compute the euclidean distance (D_1), Cityblock distance (D_2) and chess board distance (D_3) for points p and q , where p and q are $(5, 2)$ and $(1, 5)$ respectively. Give the answer in the form of (D_1, D_2, D_3) .

Q.2 Given the following 3×3 image matrix

50	100	150
200	250	100
50	75	125

i) Calculate logarithmic transformation where $C = 90$ and x are the pixel intensity values

ii) Calculate power law (gamma) transformation where $C = 1$ and $\sqrt{\text{gamma}} = 0.5$.

Provide the results for each trans.

Q.3 Explain the fundamental steps involved in digital image processing with the help of block diagram.

Q b) Construct the histogram of the given image.
Given the following 5×5 image matrix.

2	3	2	3	4
4	4	5	3	2
1	0	4	3	2
4	5	4	3	2
3	1	2	3	0

a) Perform histogram equalization to enhance the image contrast.

b) Present the transformed intensity values after equalization.

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