

Duration: 3 hrs

[Max Marks: 80]

N.B. : (1) Question No 1 is Compulsory.

(2) Attempt any THREE questions out of the remaining FIVE.

(3) All questions carry equal marks.

(4) Assume suitable data, if required and state it clearly.

Q.(1) Explain the following:

- (i) Dynamic Range Compression
- (ii) Edge Detection Operators
- (iii) Vector Quantization
- (iv) Erosion and Dilation

[20]

Q.2 (a) For given 5x5 image compute the De, D4, D8 and Dm distances between pixels p and q.

[10]

Let V be the set of gray levels to define the similarity criteria, where $V = \{2, 3\}$.

1	2	1	2	3 (q)
3	1	0	3	1
2	3	2	0	2
0	3	2	2	3
2 (p)	1	3	2	3

(b) What are point-processing techniques for enhancement? Explain Contrast Stretching in detail.

[10]

Q. 3 (a) Explain filtering in the spatial domain.

[10]

(b) Equalize the given histogram and plot the new equalized histogram. Show necessary Steps.

[10]

Gray Level	0	1	2	3	4	5	6	7
No. of Pixels	70	100	40	80	60	40	08	02

Q.4 (a) Explain Homomorphic filtering with the help of a block diagram.

[10]

(b) Compute the Hadamard transform of the given image:

[10]

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

Q.5 (a) Consider an 8-pixel line of gray scale data: [12, 12, 13, 13, 10, 13, 57, 54] which has been uniformly quantized with 6-bit accuracy. Construct its 3-bit IGS code. Compute the RMS error and rms signal to noise ratio for the decoded IGS code.

[10]

(b) Explain Lossless predictive coding with the help of suitable encoder and decoder models.

[10]

Q.6 Write short notes on ANY TWO of the following:

[20]

- (a) Chain codes and Shape Number
- (b) Hit - or - Miss Transform
- (c) Graph Theoretic Technique

---X---X---X---