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.

1 Attempt any FOUR

A Explain image fidelity criteria. **[5]**

B Write a short note on image sampling and quantization. **[5]**

C Give the names of all point processing techniques and explain any one in detail. **[5]**

D Justify/Contradict the statement "The first difference of the chain code makes it invariant to rotation". **[5]**

E Give the difference between skeletonization and thinning. **[5]**

2 A Equalize the given histogram. Also draw an equalized histogram. **[10]**

Grey level	0	1	2	3	4	5	6	7
No.of pixels	100	80	10	10	0	0	0	0

B Explain region based image segmentation. **[10]**

3 A Compare filtering in spatial domain with filtering in frequency domain. **[10]**

B Describe erosion and dilation in morphology. **[10]**

4 A Use Huffman coding technique for eliminating coding redundancy in this image. Find the Huffman code for each gray level. Also find the compression ratio. **[10]**

1	1	1	1
3	1	6	6
2	1	7	4
7	7	5	0

B Calculate HAAR transform for the sequence x(n)={10, 8, 4, 6}. Also calculate energy in each component. **[10]**

5 A Calculate D_4, D_8, Dm distance between P (Left bottom pixel) and Q (right top pixel) for v={0, 1}. **[10]**

3	1	2	1 Q
2	2	0	2
1	2	1	1
1 P	0	1	2

B Explain Discrete Fourier transform. List DFT properties and give its applications in image processing. **[10]**

6 A Write a short note on Hough transform. **[10]**

B What are the different types of data redundancies present in digital Image? Explain each type in detail. **[10]**

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