[Time: 3 Hours]   [Marks:80]

Please check whether you have got the right question paper.

N.B: 1. Question No.1 is compulsory.
        2. Solve any three questions of the remaining questions.
        3. Assume any suitable data if required.

Q.1   Answer the following (any four):-   20
    a. Explain discrete cosine transform.
    b. Distinguish between Global, Local and Dynamic Thresholding.
    c. Explain the Masks for Point detection and Line detection.
    d. Classify image compression techniques. Give examples.
    e. What do you mean by unitary matrix and orthogonal matrix?

Q.2 a. Code the following data stream using Huffman coding aaaaaabbbccccdde   10
     b. Perform Histogram equalization for following Image. Plot original and the 10
         equalized histogram

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

Q.3 a. Given are five points, use Hough Transform to draw a line joining these   10
         points.
         (1,4) (2,3) (3,1) (4,1) (5,0)
     b. Let $v=\{0,1\}$. Compute distances D_e, D_4, D_8 and D_m; between pixels p(3,0)   10
         and q(2,3)

0	1	1	1
1	0	0	1
1	1	1	1_q
1_p	1	1	1

Q.4 a. Explain with block diagram Fundamental steps in Digital Image Processing.   10
     b. Explain the properties of 2-D DFT.   10

Q.5 a. Explain Region Based Segmentation.   10
     b. Explain following morphological operations.   10
         i) Dilation ii) Erosion iii) Opening iv) Closing

Q.6   Write short notes on the following: 20
    a. Haar Transform
    b. Weiner filter
    c. High Boost Filter
    d. Homomorphic Filter

                    ****