(3 Hours) **(Total 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 from remaining **five questions.**
  3)   **Assume** suitable **data if any required.**

1.   Solve any four **(20)**
  a)   Distinguish between global, local and dynamic thresholding
  b)   Explain run length decoding
  c)   What are the differences between lossy and lossless compression
  d)   Explain slint transform
  e)   Explain Median filter

2.   a)   Explain the fundamental steps in Image processing **(10)**
  b)   Perform Histogram Equalization on gray level distribution shown in the table. What happen if the Histogram equalization is equalized twice

Gray level	0	1	2	3	4	5	6	7
No. of pixel	513	1300	950	350	100	435	100	148

3.   a)   Explain following terms with example **(10)**
  i)   Image Negative
  ii)   Gray level slicing
  iii)   Bit plane slicing
  iv)   Log transformation
  b)   Generate Huffman code for a given Image source. Calculate entropy of the same and average length of the code generated. Also calculate compression ratio achieved compared to standard binary encoding.

Level	0	1	2	3	4	5	6	7
Probability	0.1	0.09	0.02	0.01	0.5	0.2	0.03	0.05

4.   a)   Explain the Morphological operation. **(10)**
  i)   Opening
  ii)   Closing
  iii)   Thinning
  iv)   Thickening
  b)   What is Hadamurd Transform calculate the Hadamard transform of the following **(10)** Image.

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

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5. **a)** Explain the terms with diagram **(10)**
    (i) Neighbours of pixel   (ii) Connectivity
    (iii) Adjacency   (iv) Path
    b) Explain the properties of 2-D DFT **(10)**

6. Write a short notes on **(20)**
    1. Euclidian Distance, D4, D8, DM Distance
    2. Hit and Miss transform
    3. Homomarphic filtering
    4. Hough Transform for line detection