(3 hours) **Total Marks:**

N.B. 1. Question **No. 1** is compulsory
2. Attempt any **three** out of remaining
3. Assume suitable data if **necessary** and justify the assumptions
4. Figures to the **right** indicate full marks

Q.1. Answer the following 20 M

a. What is Shape Number?

b. Run length coding is lossless compression technique Explain

c. Explain City Block Distance, Chess board distance , Dm Distance

d. What would be the effect on the histogram if we set to zero, the higher order bit planes

Q.2.a What are the different types of redundancies in an image? Explain 10 M
i) Phychovisual redundancies
ii) Interpixel redundancy
iii) Coding redundancy

b. Explain Chain code with example and show that how first difference makes chain code rotation invariant. 10 M

Q.3.a Using the Butterfly diagram, compute Hadamard transform for 10 M
X(n)={ 1,2,3,4,1,2,1,2}

b. Generate the DFT Transform of the given Image 10 M

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

Q.4.a Given a histogram, what happens when we equalize it twice, comment 10 M

Grey levels	0	1	2	3
No of pixels	70	20	7	3

b. Explain Region based segmentation with an example. 10 M

Q.5.a	Find Huffman code for the following stream of data {a, a, a, b, b, c, c, c, c, c, d, d, d, d, d, d, d, e, e, e, e, f, f '	10 M
b	Explain Hough Transform with suitable example	10 M
Q.6	Write short notes on **(Any two)** a) Holomorphic Filtering b) Hit and miss transform c) Moments with Example d) Color models	20 M
