(3 Hours)

Total Marks : 80

N. B. : (1) Q.1 is compulsory.

(2)   Solve any three questions from remaining 6 questions

(3)   Assume suitable data if it is required.

Q.1 (a) Justify /Contradict the following statements   [20]
  (i) K.L. transform is also called as method of principal component analysis
  (ii) Entropy of an image is maximized by histogram equalization.
 (b) Compare: Dilation and Erosion
 (c) Explain deferment types of frames in video signal.

Q.2 (a) For following Digital image as shown in Fig.(2), find (i) Negative of the image
  (ii) Bit plane slicing (iii)Perform contrast modification as per the characteristics given in fig 1
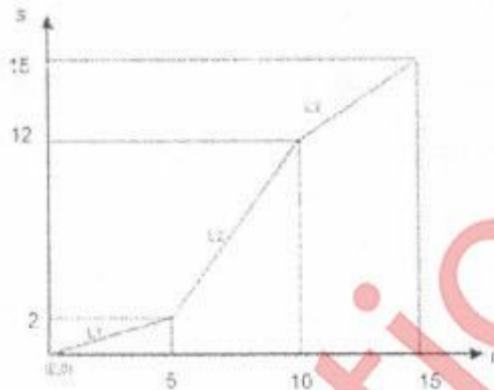 (iv) Draw histogram of new   image   [10]

10	2	13	7
11	14	6	9
4	7	3	2
0	5	10	7

Fig.(1)   Fig.(2) Digital Image

(b)Explain dynamic range compression techinque with application .   [05]
(c) Explain image deradation model in detail.   [05]
Q.3 (a) Write short no on: Wiener Filter   [08]

  b) Find DFT of the following image   [06]

0	1	2	1
1	2	3	2
2	3	4	3
1	2	3	2

(c) Given set of points use Hough transform to join these points   [06]
  A(1,4) , B(2,3) , C(3,1) , D(4,1) , E(5,0)

[TURN OVER]

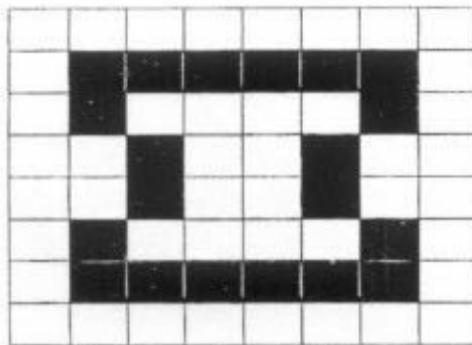Q.4 (a) Consider the following image   [10]

(i)Perform Low Pass Filtering
(ii) Perform Median Filtering
(iii) Find High pass fitered output.
(iv) compare result in(i) and (ii).

0	5	4
7	120	5
4	3	7

(b) What are the different motion estimation criteria for video signal.Explain Phase   [10]
correlation method for motion estimation .

Q. 5 (a) Explain image enhancement in frequency domain in detail   [08]

(b) The input image and structuring element is as shown in the figure. Perform region filling   [08]
Operation

Input Image   Stucturing element

(c) Define edge in an image. Give different edge detection mask.   [04]

Q.6 (a) Using Graph Theoretical approach, find the edge corresponding to the minimum cost path [06]

$$1 \quad 2 \quad 0$$
$$2 \quad 6 \quad 4$$
$$4 \quad 3 \quad 3$$

(b) Segment the following image using region split and merge technique .Draw quad tree
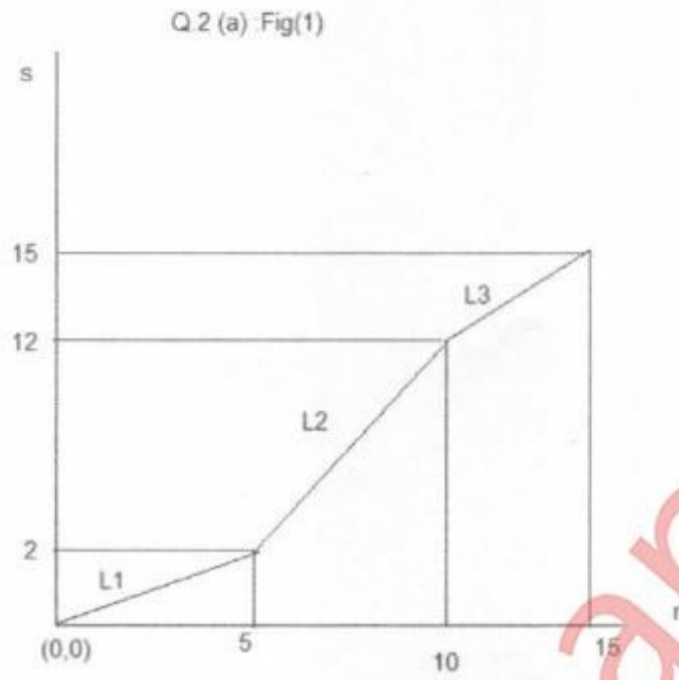representation for the corresponding segmentation.   [06]

(c) What is unitary transform.   [04]

(d) Explain in brief Hit or Miss Transform   [04]

Q.2 (a) :Fig(1)

L1,L2 and L3 are slopes in the three regions.