

BE (Comp) VII  
Image Processing

(3 Hours)

04/06/09  
11-2 p.m.  
VR-4752

[ Total Marks : 100

- N.B.** (1) Question No. 1 is **compulsory**.  
 (2) Attempt any **four** out of remaining **six** questions.  
 (3) Assume suitable **data** wherever **necessary** and state it.

1. Write short notes on any **four** :— 20  
 (a) a Image formation in the eye  
 (b) Application of image processing  
 (c) Wavelet transforms  
 (d) Image compression technique  
 (e) Chain code.
2. (a) Given a  $4 \times 4$  image whose gray level, orders lexicographically are as follows : 10  
 3 1 2 0 2 0 3 1 2 3 1 0 1 3 0 2 calculate the spatial moments up to second order.  
 (b) Explain filtering in frequency domain. 10
3. (a) Explain the different operators used for segmentation of an image. 10  
 (b) Illustrate the following technique :— 10  
 (i) Arithmetic code  
 (ii) Bit plane coding.
4. (a) Describe the General Compression System Model for Digital Images. 10  
 (b) Write the  $8 \times 8$  matrix for Walsh transform. Write the characteristics of Walsh 10  
 transform. Show the Walsh basic function for  $N = 4$ .
5. (a) Explain the following boundary descriptors. 10  
 (i) Fourier Descriptor (ii) Moments (iii) Shape numbers.  
 (b) Explain image averaging and Image subtraction ? 10
6. (a) Write note on Discrete Cosine Transform and its application in Image Processing. 10  
 (b) What is morphology ? Name and explain the basic operations in morphology. 10
7. (a) Plot the Histogram for the following image. Perform Histogram Equalization and 10  
 then plot the Equalized Histogram and Histogram Equalized Image.

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

- (b) Explain with example : Thinning and Global Processing via Graph Theoretic 10  
 Techniques.