

**B.Tech. Degree VII Semester (Supplementary) Examination in  
Information Technology  
March 2003**



**IT 705 (B) DIGITAL IMAGE PROCESSING  
(1995 & 1998 Admissions)**

Time: 3 Hours

Maximum Marks: 100

- I. (a) Explain several important transformations used in imaging. (10)  
 (b) Derive expressions for the image co-ordinates of a point 'W' whose world co-ordinates are (X, Y, Z). (10)
- OR**
- II. (a) Briefly discuss the role of discrete 2 – D transforms in image processing. (10)  
 (b) What is meant by a separable 2 – D transforms?  
 What is the advantage of a separable transform? Show that the discrete 2- D Fourier transform is separable. (10)
- III. (a) Explain the principle of spacial filtering. (10)  
 (b) Explain contrast stretching. Give an example. (5)  
 (c) Explain the principle for neighbourhood averaging for noise cleaning. (5)
- OR**
- IV. (a) Explain briefly the principle of interactive restoration. (10)  
 (b) How is Wiener filter useful in image restoration? (10)
- V. (a) Explain clearly the principle of run-length coding. Under what conditions is this coding efficient? (10)  
 (b) Describe, in detail, any lossy compression technique. (10)
- OR**
- VI. (a) Explain the JPEG compression technique for image compression. (10)  
 (b) Explain transform coding technique. (10)
- VII. (a) What are the various techniques used for detecting discontinuities in a digital image? Explain. (10)  
 (b) Bring out the collinearity-detection property of the Hough transform and briefly discuss its application in image processing. (10)
- OR**
- VIII. (a) Explain the split and merge algorithm used in image segmentation. (10)  
 (b) What is the use of motion in segmentation? (10)
- IX. (a) Describe any one image representation scheme. (10)  
 (b) What are signatures? Briefly explain. (10)
- OR**
- X. (a) What is meant by image analysis?  
 Explain the elements of image analysis. (10)  
 (b) Explain morphology as a tool for extracting image components that are useful in the representation and description of region shapes. (10)