

B.Tech. Degree VII Semester (Supplementary) Examination June 2006

IT//CS/EE 705 (A) DIGITAL IMAGE PROCESSING (2002 Admissions onwards)

Time: 3 Hours

Maximum Marks: 100

- I a) Differentiate between image enhancement and image restoration. (10)
b) State the principle of image data compression. Where is it required in image processing. (10)
- OR**
- II a) Define: (i) Separable systems
(ii) 2-D Fourier transform
(iii) Stationary process (9)
b) Define Kronecker product of 2 matrices and find the Kronecker product of A & B where

$$A = \begin{bmatrix} 1 & 1 \\ 1 & -1 \end{bmatrix} \text{ and } B = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix} \quad (11)$$
- III a) Explain the following terms:
(i) Match band effect
(ii) MTF of visual system
(iii) Luminance, brightness and contrast (12)
b) Describe the colour vision model. (8)
- OR**
- IV a) State and explain 2-D sampling theorem. (6)
b) State the practical limits with respect to image sampling and reconstruction (6)
c) What is colour matching? Explain the important laws of colour matching. (8)
- V a) What is a unitary transform? Explain with an example. State its properties. (12)
b) Generate Hadamard transform of order 3. (8)
- OR**
- VI a) Define 2-D Discrete Cosine Transform and state its properties. (12)
b) State the properties of Haar Transform. (8)
- VII Explain in detail any spatial domain methods for image enhancement. (20)
- OR**
- VIII a) Explain the basic principle of homomorphic filtering. (8)
b) Write short notes on colour image enhancement. (6)
c) Explain linear interpolation. (6)
- IX a) Explain different techniques used for feature extraction. (12)
b) Explain the principle of operation of edge detectors. (8)
- OR**
- X a) Explain with block diagram a computer vision system. (8)
b) Describe clearly how lines and spots can be detected in an image. (12)