B. Tech.
(Sem. VIII) Examination. 2006-07
IMAGE PROCESSING

Time : 3 Hours] [Total Marks : 100

Note : (1) Attempt all questions.
(2) All questions carry equal marks.

1 Attempt any two parts of the following : 10x2=20
   (a) Describe the sequence of operations of a
       image processing system. Define and
       differentiate light, luminance, brightness and
       contrast. Discuss Mach Band effect.
   (b) Draw the monochrome vision model and
       explain it. What do you mean by image fidelity
       criteria, explain in terms of subjective and
       quantitative measures.
   (c) Define Nyquist Rate, Aliasing and Foldover
       frequencies. Discuss Lloyd – Max quantizer
       of image with mathematical expressions.

V-3068] 1 [Contd...
2 Attempt any two parts of the following: \(10 \times 2 = 20\)

(a) Discuss DCT (Discrete Cosine Transform) with the help of mathematical expressions. Enumerate the properties of discrete cosine transform.

(b) Why Hadamard Transform is most suitable for digital image processing? Discuss Hadamard Transform with the help of mathematical expression.

(c) What do you mean by image enhancement? What are various image enhancement techniques? Describe Histogram modelling method for image enhancement.

3 Attempt any two parts of the following: \(10 \times 2 = 20\)

(a) Differentiate between image enhancement and image restoration. Draw the block diagram of image restoration system and explain.

(b) Define and differentiate the inverse and Wiener filter. Discuss the use of Wiener filter in image processing. What do you mean by speckle? Describe a method for speckle reduction.

(c) Write short notes on RLC (Run Length Coding) and Predictive Compression.

V–3068] 2 [Contd...
4 Attempt any two parts of the following: 10×2=20
(a) What do you mean by image segmentation? 10
What are different image segmentation techniques? Describe texture segmentation technique.
(b) A printed circuit board can be considered as network of paths. Develop a vision system for isolating open circuit and short circuit with pathways. Discuss including preprocessing, segmentation and recognition algorithms.
(c) Write short notes on edge detection and edge linking.

5 Attempt any two parts of the following. 10×2=20
Describe the image processing system with techniques used for:
(a) Finger Print Classification
(b) Signature Verification
(c) Biological Cell Classification