

Total No. of Questions : 12]

SEAT No. :

**P849**

**[4659] - 227**

[Total No. of Pages : 3

**B.E (Computer Engineering)**  
**a - IMAGE PROCESSING**  
**(Elective - I) (2008 Course) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

- 1) *Answer 3 questions from Section - I and 3 questions from Section - II.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Assume suitable data, if necessary.*

**SECTION - I**

- Q1)** a) Define an image and image Processing system. Enlist and discuss the various components of a general purpose image processing systems. **[10]**
- b) Find the number of bits required to store a  $512 \times 512$  image with 16 gray levels. **[4]**
- c) Explain the basic relationships between pixels. **[4]**

OR

- Q2)** Explain the following (Any three) **[18]**
- a) Human Visual System.
  - b) Digital imaging.
  - c) Matrix theory applied to images.
  - d) Usage of digital image processing.

- Q3)** a) Explain contrast enhancement and color balancing image preprocessing techniques. **[8]**
- b) Explain Hadamard transformation in detail and also discuss its properties. **[8]**

OR

**P.T.O.**

- Q4)** a) Discuss the image enhancement techniques in spatial and frequency domain. [8]  
b) Explain with an example sampling and quantization. Explain the effects of reducing sampling and quantization. [8]

- Q5)** a) Explain in detail the process of feature extraction. [8]  
b) Discuss the use of motion in segmentation. [8]

OR

- Q6)** a) Discuss about the region based image segmentation techniques. [8]  
b) Discuss about texture and shape measures used in feature extraction. [8]

### **SECTION - II**

- Q7)** a) Discuss noise models with some significant Noise probability density functions. [8]  
b) What is image restoration. Discuss its techniques in brief. [8]

OR

- Q8)** Explanation. [16]  
a) Blind de-convolution technique.  
b) Wiener filtering.

- Q9)** a) Discuss the classification of the compression techniques and explain any one in detail. [8]  
b) Explain simple boundary descriptor and regional descriptors. [8]

OR

- Q10)** a) What do you mean by object recognition. Discuss how the objects are represented. [8]  
b) Compare and contrast lossy and lossless compression techniques. [8]

- Q11)** a) Define Wavelets and discuss how image compression is done using wavelets. [10]  
b) Explain Principal component analysis. [8]

OR

**Q12)** Write a short note on (Any three) [18]

- a) Haar Wavelets.
- b) Sub-band coding.
- c) Local Component analysis.
- d) Application of Image Processing.

