

Total No. of Questions : 12]

SEAT No. :

P3046

[5154]-614

[Total No. of Pages : 3

B.E. (Electronics & Telecommunication)
DIGITAL IMAGE PROCESSING
(2012 Course) (Elective - I) (Semester - I) (End Sem)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Neat diagram must be drawn wherever necessary.*
- 2) *Figures to the right indicate full marks.*
- 3) *Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- 4) *Assume suitable data, if necessary.*

- Q1) a)** Describe spatial resolution in images. **[4]**
- b) List image file formats. Which information is available in the header of image file. **[2]**

OR

- Q2) a)** Explain the terms: **[4]**
- i) City block distance
 - ii) Chess board distance
- b) Explain YIQ colour space. List its application. **[2]**

- Q3) a)** Explain the difference between point processing and mask processing operation with the help of suitable example. **[4]**
- b) What is meant by image smoothing? Write one application of the same. **[3]**

OR

- Q4) a)** Explain image restoration with the help of block diagram. **[4]**
- b) Which filter is used to remove salt and pepper noise effectively? Justify your answer. **[3]**

P.T.O.

- Q5) a)** Explain the need of fidelity criteria in image compression. Write any two fidelity measures. **[4]**
- b) How the entropy of image is calculated? Write significance of entropy in image processing. **[3]**

OR

- Q6) a)** Generate Huffman code for following data. Calculate efficiency of Huffman code. **[4]**

Graylevel	Probability
a ₁	0.1
a ₂	0.4
a ₃	0.06
a ₄	0.1
a ₅	0.04
a ₆	0.3

- b) What is meant by blocking artifact? Where is it observed? **[3]**

- Q7) a)** What is image dilation? Perform image dilation of matrix A using structuring element S. **[9]**

$$A = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 1 & 1 & 0 \\ 0 & 1 & 1 & 1 & 0 \\ 0 & 1 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 \end{bmatrix} \quad S = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$$

- b) What is image segmentation? Explain adaptive thresholding. Write its application. **[9]**

OR

- Q8) a)** Explain how boundary extraction is achieved using dilation and erosion. Explain any one application of boundary extraction. **[9]**
- b) Explain thinning and thickening operations in image morphology. Explain the term morphology. **[9]**

- Q9)** a) What are chain codes? Explain with the help of example. [8]
b) What is image representation? Explain any two image representation techniques. [8]

OR

- Q10)** a) Explain boundary descriptors used in image processing. [8]
b) What is principal Component Analysis? Explain in detail and write its application. [8]

- Q11)** a) Explain template matching for object recognition with example. [8]
b) Explain the concept of classifier with the help of block diagram explain steps in typical object recognition process. [8]

OR

- Q12)** a) Explain character recognition system with the help of block diagram. [8]
b) What is content Based Image Retrieval? Explain one application in detail. [8]

