Total No. of Questions : 12]

SEAT No. :

P3926

[Total No. of Pages : 3

[4859]-1039
B.E. (E & TC)
DIGITAL IMAGE PROCESSING (Elective - I)
(2012 Pattern) (Semester - I)

Time : 2.30 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Neat diagrams must be drawn whenever necessary.***
2) ***Figures to the right indicate full marks.***
3) ***Your are advised to attempt not more than 6 questions.***
4) ***Your answers will be valued as a whole.***
5) ***Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.***
6) ***Assume sutiable data, if necessary.***

Q1) a) What is color model? Compare RGB & YIQ color model with their applications. **[4]**

b) Explain use of logical operation in short. **[2]**

OR

Q2) a) Compute the length of the shortest distance using 4,8 and m path connectivity between p & q.

Let V = {1,2}

	3	1	2	1	(q)
	2	2	0	2	
	1	2	1	1	
(p)	1	0	1	2	

[3]

b) Explain image subtraction operation in detail along with its application. **[3]**

Q3) a) Explain how power-law transformation can be used for gamma correction. **[4]**

b) Explain the difference between image enhancement & restoration? List various algorithms used for the processing in case of restoration. **[3]**

P.T.O.

OR

Q4) a) Answer the following related to histogram of an image **[4]**

i) If all pixels in an image are shuffled, will there be any change in the histogram. Justify your answer.

ii) Can two different image have same histogram? Justify your answers.

b) Explain the notch filtering in frequency domain. **[3]**

Q5) a) Explain arithmatic coding with example. **[4]**

b) Explain how bit plane coding is useful for run lenght coding. **[3]**

OR

Q6) a) Explain w.r.t. image compression fidelity criteria. **[4]**

b) What is DCT? How DCT helps to achieve compression. **[3]**

Q7) a) Explain the various types of thresholding techniques used in image segmentation. **[9]**

b) What is morphology? Explain the dilation of binary image A by structuring element B. **[9]**

$$A = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 1 & 1 & 1 & 0 & 0 \\ 0 & 1 & 1 & 1 & 0 & 0 \\ 0 & 0 & 1 & 1 & 1 & 0 \\ 0 & 0 & 1 & 1 & 1 & 0 \\ 0 & 0 & 0 & 0 & 0 & 0 \end{bmatrix} \qquad B = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 1 & 1 \\ 0 & 1 & 0 \end{bmatrix}$$

OR

Q8) a) What is edge detection? Compare first order & second order edge detector operator w.r.t. an image. Which one will be used in which application. **[9]**

b) What is Region Growing? Explain the techniques of Region splitting & Region merging. **[9]**

Q9) a) Explain 4 directional & 8 directional chain coding with example. Assume suitable distance between chain code. **[8]**

b) Explain following regional deseriptors

i) Topological

ii) Texture **[8]**

OR

Q10 a) What is PCA? How PCA is used for deseription/representation of an image. **[8]**

b) What are the different ways of image boundary representation? How fourier descriptors are used for boundary representation & what are its advantages. **[8]**

Q11 a) What is feature? What is feature extraction, feature selection & classification. Explain the concepts with the help of example application. **[8]**

b) Explain content based image Retrieval application in detail. **[8]**

OR

Q12 a) What are the different pattern classification algorithms? Explain any one in detail. **[8]**

b) Expalin the various applications of image processing in medical field. **[8]**