Total No. of Questions : 12]

SEAT No. :

P1763

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B.E. (Electronics)

b-IMAGE PROCESSING AND MACHINE VISION

(2008 Course) (Elective-III) (Semester-II)

Time : 3 Hours] *[Max. Marks :100*

Instructions to the candidates:

1) ***Answer three Questions from section one and three Questions from section two.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

SECTION-I

Q1) a) How digital image is generated from analog image? Explain fundamental steps in digital image processing with the help of diagram? **[10]**

b) What are the basic relationship between the pixels ? Explain? **[8]**

OR

Q2) a) Define the following image processing terms and give their significance. **[10]**

i) Mean

ii) Standard Deviation

iii) Variance

iv) Signal to Noise Ratio.

v) Histogram of an Image.

b) Explain Mach Band Effect and simultaneous contract wrto Digital Image? **[8]**

P.T.O.

Q3) a) What is Histogram Equalization and Histogram Matching? Explain Histogram Equalization in detail. **[8]**

b) Explain the following image Enhancement techniques,

i) Power law transformation

ii) Contrast stretching. **[8]**

OR

Q4) a) Explain in detail Gaussian filtering with example? **[8]**

b) What are the different image enhancement filters used in frequency domain? Explain. **[8]**

Q5) a) What is Hough Transform? Explain, how it is useful in line detection? **[8]**

b) What is Global thresholding and Local thresholding? How, we can select threshold value for optimum segmentation. **[8]**

OR

Q6) a) Explain region splitting and merging for image segmentation? **[8]**

b) How, Histogram is used for image segmentation? Give the algorithm for threshold selection using Histogram? **[8]**

SECTION-II

Q7) a) What are the different types of data redundancies in an image? Explain ? **[10]**

b) What is lossy compression and lossless compression? Compare based on performance parameters, advantages, disadvantages and applications. **[8]**

OR

Q8) a) Define Discrete cosine Transform? Explain, how it can be used for image compression? **[10]**

b) Explain the Image pyramid used for multiresolution image analysis? **[8]**

Q9) a) Find the expression for the signatures of the following boundaries and plot the signatures. **[8]**

i) Square

ii) Equilateral Triangle.

b) What is Texture? How it is identified? Give the application of Texture analysis? **[8]**

OR

Q10)a)Explain any two descriptors used for Boundary description? **[8]**

b) What is skeletonization ? Explain, how it can be used for image representation. **[8]**

Q11)a) What is Graph theory? Explain the use of Graph theory for object Recognition? **[8]**

b) What is statistical pattern Recognition & Syntactic pattern Recognition? Compare the same? **[8]**

OR

Q12)a) Explain the concept of 3D vision? What is its application? **[8]**

b) Give the algorithm for finger print recognition in Digital Image Processing?

Also, list the features to be extracted for finger print recognition. **[8]**