Total No. of Questions : 10] **SEAT No. :**

P4898 **[Total No. of Pages : 2**

[4959] - 1104

B.E. (Electronics)

IMAGE PROCESSING AND MACHINE VISION

(2012 Pattern) (Semester - I) (Elective - I(a))

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates :-

1) ***Answer Q1 or Q2, Q3 of Q4, Q5 of Q6, Q7 of Q8, Q9 or Q10.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume Suitable data, if necessary.***

Q1) a) What is connectivity between the pixels? Explain, following with reference to connectivity between the Pixels. **[6]**

i) 4-Connectivity

ii) 8-Connectivity

iii) Mixed connectivity

b) Explain the following image enhancement methods. **[4]**

i) Log Transformation

ii) Power Law Transformation

OR

Q2) a) Compare following image transformation techniques. **[6]**

i) DFT

ii) DCT

b) Explain simultaneous contrast and brightness adaptation of an image in detail. **[4]**

Q3) a) What is Histogram equalization? Explain in detail. **[6]**

b) Explain in detail frequency domain smoothening and sharpening filters. **[4]**

OR

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Q4) a) Explain Haar Transform in detail. Where do you find the application of Haar Transform. **[6]**

b) Explain in detail Spatial Resolution and Gray level Resolution. **[4]**

Q5) a) Explain Laplacian and gradient operators for edge detection. Derive the mask for Laplacian edge detector. **[8]**

b) What is split and merge image segmentation technique? Explain in detail. **[8]**

OR

Q6) a) Explain Hough transform. Explain how it is used to determine the colinearity of points. **[8]**

b) Explain Edge linking and Boundary Detection by Local processing. **[8]**

Q7) a) Explain Run Length Coding. Derive RLC codes considering 4×4 binary image. **[8]**

b) With the help of block diagram, explain the process of lossless predictive encoding and decoding. **[8]**

OR

Q8) a) What is Redundanry? Explain different types of Redundancies in the image. **[8]**

b) Compare JPEG and MPEG standards of compression. **[8]**

Q9) a) Explain with block schematic Medical Imaging using Image Processing. Also write its algorithm. **[10]**

b) Explain the Image Degradation model with the help of block schematic. **[8]**

OR

Q10) a) What are the different features required for character recognition and finger print Recognition? Explain. **[10]**

b) How Image processing is used for Acoustic Imaging? Explain with the help of algorithm. **[8]**