Total No. of Questions : 4] **SEAT No. :**

PB133 **[Total No. of Pages : 2**

[6269]-347
T.E. (E & TC Engineering) (Insem)
DIGITAL IMAGE PROCESSING
(2019 Pattern) (Semester - II) (Elective - II) (304195 (A))

Time : 1 Hour] ***[Max. Marks : 30***

Instructions to the candidates:

1) ***Attempt questions Q.1 or Q.2 and Q.3 or Q.4.***
2) ***Figures to the right indicate full marks.***
3) ***Assume suitable data if necessary.***
4) ***Neat diagrams must be drawn wherever necessary.***

Q1) a) With the help of neat diagram explain various steps in image processing. **[6]**

b) Explain sampling and Quantization in Image Processing. How does it affect on spatial and gray level resolution in images? **[5]**

c) What are the different types of image? Explain any four in short. **[4]**

OR

Q2) a) Write a short note on elements of digital image processing system. **[5]**

b) What is color model? Explain RGB and CMY color models. State applications of both. **[5]**

c) Find the distance between pixels P and Q by following methods. **[5]**

i) Euclidean

ii) City block

iii) Chess board for 5×5 image is given below.

1	0	0	0	1	P
0	0	0	1	1	
1	0	1	1	0	
0	0	1	0	1	
0	1	1	0	0	
	Q				

Coordinates of P & Q are (0, 4) and (4, 1)

P.T.O.

Q3) a) Specify the need of Image enhancement and Explain Spatial filtering in Image enhancement. **[5]**

b) What is necessity of High boost filtering? How it is achieved? **[5]**

c) What is median filter? Apply 3*3 median filter to given 4*4 gray scale image and find the processed image by considering outer row and columns are as it is. **[5]**

5	6	7	8
6	0	7	8
5	6	15	8
5	6	7	8

OR

Q4) a) Explain average filtering of an image with example. **[5]**

b) Explain the following concepts in image enhancement. **[5]**

i) Gray level slicing and

ii) Log Transformation

c) Obtain Histogram and Perform histogram equalization for a given (5*5) 3 bit image. **[5]**

$$I = \begin{bmatrix} 4 & 4 & 4 & 4 & 4 \\ 3 & 4 & 5 & 4 & 3 \\ 3 & 5 & 5 & 5 & 3 \\ 3 & 4 & 5 & 4 & 3 \\ 4 & 4 & 4 & 4 & 4 \end{bmatrix}$$

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