Total No. of Questions : 6]

SEAT No. :

P4948

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BE/In Sem. - 41
B.E. (E & TC)
DIGITAL IMAGE PROCESSING
(2012 Course) (Semester -I) (Elective - I) (404184A)

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

Instructions to the candidates:

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

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

b) Explain the following terms. **[4]**

i) Histogram of Image

ii) Scaling and Rotation of Image.

OR

Q2) a) With Reference to relation bet^{n} pixels Explain **[6]**

i) 4 connectivity

ii) 8 connectivity

iii) Mixed connectivity

b) Explain the color conversion concept of RGB to HSI and HSI to RGB. **[4]**

Q3) a) Explain the following Gray level transformation techniques:- **[6]**

i) Log transformation

P.T.O.

ii) Power law transformation

iii) Contrast stretching

b) Compare Image enhancement and Image Restoration. **[4]**

OR

Q4) a) Perform histogram equalization of image shown in fig. (1). Containing gray levels for 0 to 7. Also draw histogram before and after equalization **[6]**

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

Fig. 1

b) Explain any two types of Noise models. **[4]**

Q5) a) Define Redundancy? Explain the different types of Redundancies in the image. **[6]**

b) Explain the DCT based image compression model. **[4]**

OR

Q6) a) A simple 4×4 Image is represented by following matrix: **[6]**

$$\begin{bmatrix} 20 & 140 & 100 & 20 \\ 20 & 140 & 100 & 20 \\ 240 & 140 & 240 & 240 \\ 240 & 140 & 240 & 240 \end{bmatrix}$$

i) Determine the entropy of Image.

ii) Generate a simple Huffman code book for various grey levels in the Image.

b) Explain fidelity criteria in the Image compression. **[4]**

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