Total No. of Questions : 6]

SEAT No. :

P5148

[Total No. of Pages : 2

B.E./Insem. - 554

B.E. (E & TC) (Semester - I)

DIGITAL IMAGE PROCESSING

(2012 Pattern) (Elective - I)

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

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q5 or Q.6.***
2) ***Neat diagram must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Explain the terms: **[6]**

i) Sampling & quantization in image processing

ii) Spatial resolution

iii) Gray-level resolution

b) What is an image file format? Explain any one format. **[4]**

OR

Q2) a) Explain various techniques to measure the distance between two pixels p & q. If v = {0,1}, compute the distances between the pixels p & q in the image I, where the co-ordinates of p & q are (3,0) and (2,3) respectively. **[6]**

$$I = \begin{bmatrix} 0 & 1 & 1 & 1 \\ 1 & 0 & 0 & 1 \\ 1 & 1 & 1 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

b) Explain histogram. Draw the histogram for the 4×4 image I, given below. **[4]**

$$I = \begin{bmatrix} 2 & 3 & 3 & 2 \\ 4 & 2 & 4 & 3 \\ 3 & 2 & 3 & 5 \\ 2 & 4 & 2 & 4 \end{bmatrix}$$

P.T.O.

Q3) a) Explain the following piece-wise linear operations. **[6]**

i) Contrast stretching

ii) Gray-level slicing

iii) Bit-plane slicing

b) Write a note on homomorphic filtering. **[4]**

OR

Q4) a) Explain image smoothing by following methods. **[6]**

i) Low pass filtering (with suitable mask)

ii) Median filtering

Compare both the techniques.

b) Describe restoration using inverse filtering. **[4]**

Q5) a) Explain the terms: **[6]**

i) Coding redundancy

ii) Interpixel redundancy

iii) Psychovisual redundancy

b) Compare lossy and lossless image compression. **[4]**

OR

Q6) a) Explain any two lossless compression techniques with the help of a suitable example. **[6]**

b) Explain the terms: **[4]**

i) Compression ratio

ii) JPEG image compression standard.

⊖⊖⊖