

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.

