

Total No. of Questions : 8]

SEAT No. :

P3554

[Total No. of Pages : 2

[4959] - 1154

**B.E. (Computer Engineering) (Semester - I)**

**Image Processing**

**(2012 Pattern) (Elective - I)**

Time :  $2\frac{1}{2}$  Hours]

[Max. Marks : 70

*Instructions to the candidates:*

- 1) Answer Que. 1 or Que. 2, Que. 3 or Que. 4, Que.5 or Que. 6, Que.7 or Que. 8.
- 2) Neat diagrams should be drawn wherever necessary.
- 3) Use of electronic pocket calculator is allowed.
- 4) Assume suitable data, if necessary.

- Q1)** a) Explain Nyquist rate, aliasing effect and fold over frequencies in case of two dimensional sampling. [6]
- b) Explain frequency domain techniques used in image enhancement. [8]
- c) What is Fourier descriptor? Explain how Fourier descriptor help in object recognition? [6]

OR

- Q2)** a) Explain elements of image processing in detail. [6]
- b) Define histogram. Discuss how histogram equalization helps in image enhancement. [8]
- c) Explain watershed segmentation method in image processing. [6]

- Q3)** a) Explain the methods used for lossless image compression. [8]
- b) Define feature and pattern. Explain in brief relationship between image processing and object recognition. [8]

OR

**P.T.O.**

- Q4)** a) Explain different approaches for object recognition. [8]  
b) For the image shown below, compute the degree of compression that can be achieved using Huffman coding of pixel values. [8]

$$\begin{bmatrix} 3 & 3 & 3 & 2 \\ 2 & 3 & 3 & 3 \\ 3 & 2 & 2 & 2 \\ 2 & 1 & 1 & 0 \end{bmatrix}.$$

- Q5)** a) Write a short note on any two: [10]  
i) Images from X-rays and its application.  
ii) Images from r-rays.  
iii) Does and risk.  
b) Explain picture archives and communication systems (PACS). [8]

OR

- Q6)** a) What are the medical imaging modalities? Explain in brief. [10]  
b) How could the contrast of a displayed X-ray computed to mammography image be increased? Explain. [8]

- Q7)** a) Discuss workflow of digital photogrammetric process. [8]  
b) Explain coordinate system for photogrammetry. [8]

OR

- Q8)** a) Explain remote sensing process and state advantages and limitation of remote sensing. [8]  
b) Explain different stereo imaging concepts from satellites. [8]

