

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 121853

Roll No.

**B.TECH.**

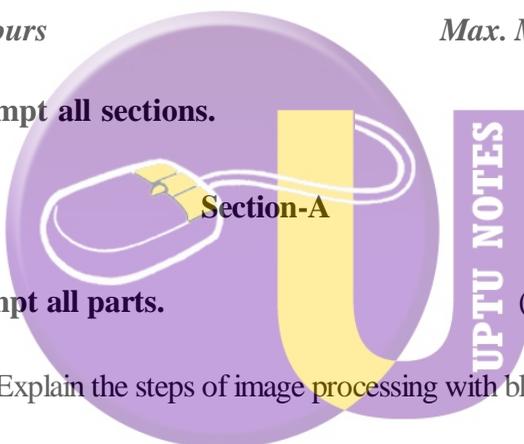
**Theory Examination (Semester-VIII) 2015-16**

**IMAGE PROCESSING**

*Time : 3 Hours*

*Max. Marks : 100*

**Note: Attempt all sections.**



**1. Attempt all parts.** (2×10 = 20)

- (a) Explain the steps of image processing with block diagram.
- (b) Explain sampling and quantization. Explain the effects of reducing sampling and quantization.
- (c) Give various grey level slicing techniques.
- (d) Define sampling and quantization.
- (e) Explain smoothing and sharpening.

- (f) What do you mean by stereo imaging elements of visual perception?
- (g) What is meant by thresholding approaches?
- (h) Discuss Hough transform.
- (i) How biometric features can be useful for recognition?
- (j) Explain topological and texture analysis in brief.

2. Attempt any five questions.

[10×5=50]

- (a) What is meant by image quantizer? What are the advantages of image quantizer
- (b) Find the expression for DFT of an  $N \times N$  image  $u(m,n)$  and the properties of this transform.
- (c) Draw the block diagram of a digital image restoration system and explain it. Discuss Wiener filter.
- (d) What are different types of image quantizer. Discuss uniform optimal quantizer.

- (e) For the image matrix given below compute the compression that can be achieved using Huffman coding:

$$f(m,n) = \begin{bmatrix} 2232 \\ 2322 \\ 3223 \\ 2110 \end{bmatrix}$$

- (f) Derive the mathematical expression for DCT and write its properties.
- (g) What are the different classification techniques? Differentiate between supervised and unsupervised techniques. Discuss unsupervised method.

**Section-C**

**Attempt any Two questions :**

(2×15=30)

3. What is histogram? For what purpose is it used? Explain histogram specification with example. Discuss image compression techniques.
4. Explain and draw the block diagram of image restoration. What is constrained and unconstrained restoration? Explain motion blur remover in detail.

5. Explain the following:
- (a) Fingerprint classification
  - (b) Signature verification
  - (c) Text recognition

