



**PAPER ID : 2110**

**TEC-044**

**Printed Pages : 3**

Paper ID and Roll No. to be filled in your Answer Book

Roll No. 

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**B. Tech.**

**(SEM. VIII) EXAMINATION, 2010**

**DIGITAL IMAGE PROCESSING**

**(Elective - IV)**

**Time : 3 Hours]**

**[Total Marks : 100**

- Note :**
- (1) Attempt **all** questions.
  - (2) All questions carry **equal** marks.

**1 Attempt any four : 5×4=20**

- (a) What is Image Processing ? Write various applications where image processing can be used alongwith an example.
- (b) How an image is represented on any digital system? What are components of an image processing system?
- (c) What is meant by image sampling? How can you judge the number of samples required for good approximation of an image?
- (d) What are the various schemes to define the connectivity between the pixels?
- (e) Explain the following:
  - (i) Aliasing
  - (ii) Nyquist rate.

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**1**

**[Contd...**

- (f) How many samples are required to preserve the image that has the dimension  $4 \times 6$  inches and frequency of 300dpi in each direction?

**2 Attempt any four**

**5×4=20**

- (a) State the properties of 2D-DFT.
- (b) Write the algorithm to generate Haar basis.
- (c) Write some basic intensity transformation functions and their application.
- (d) Determine the Hadamard matrix of order  $N=4$  and obtain its inverse.
- (e) Explain the process of Histogram specification.
- (f) What is meant by image averaging? Discuss various areas where it is applied.

**3 Attempt any four :**

**10×2=20**

- (a) Give classification of image restoration techniques. Discuss the various linear image restoration techniques.
- (b) What is the difference between image enhancement and image restoration?
- (c) What are the various types of noise encountered in most images? Discuss the image denoising in detail.

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[Contd...

4 Attempt any **two** : 10×2=20

- (a) Discuss the block Transform coding in detail.
- (b) Explain the working of source encoder and decoder in image compression.
- (c) What do you mean by predictive coding? Discuss in detail the various predictive coding techniques.

5 Attempt any **two** : 10×2=20

- (a) Explain the role of thresholding in image segmentation. Discuss various thresholding methods for image segmentation.
  - (b) What is meant by gradient operators? Discuss their role in edge detection.
  - (c) Write short notes on the following:
    - (i) Chain codes
    - (ii) Regional descriptors.
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