

**R15**

Code No: 127CJ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, January/February - 2023

**DIGITAL IMAGE PROCESSING**  
**(Electronics and Communication Engineering)**

Time: 3 Hours

Max. Marks: 75

Note: i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

**PART - A**

**(25 Marks)**

- 1.a) How to represent an Image? [2]
- b) What is the need of sampling and quantization? [3]
- c) Define median filter. [2]
- d) Compare spatial domain and frequency domain image enhancement. [3]
- e) Draw the degradation model of Image Processing. [2]
- f) Why the restoration is called as unconstrained restoration? [3]
- g) Write about linking edge points. [2]
- h) Write the applications of segmentation. [3]
- i) Define compression ratio. [2]
- j) What are two main types of Data compression? [3]

**PART - B**

**(50 Marks)**

- 2.a) Define Haar transform and Write the properties of Haar transform.
- b) Discuss the Relationship between Pixels in detail. [5+5]

**OR**

- 3.a) Define the 2-D FFT and Write its properties.
- b) Find out the Slant transform matrix for  $N=8$ . [5+5]

- 4.a) Explain the use of histogram statistics for image enhancement.
- b) What is point processing? Explain how it improves image enhancement? [5+5]

**OR**

- 5.a) Write short note on spatial domain high-pass filtering.
- b) Explain the role of Filtering in frequency domain. [5+5]

- 6.a) Discuss the concept of algebraic image restoration.
- b) Explain the model of image degradation process. [5+5]

**OR**

7. Discuss in detail the image restoration using minimum mean square error filtering. [10]

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8.a) What is difference between thresholding based and region based segmentation.

b) Describe the region splitting and merging algorithm.

[5+5]

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**OR**

9.a) Write about region oriented segmentation.

b) Explain the role of Hit or Miss transformation in morphological image processing. [5+5]

10. What are the redundancies and explain their removal methods.

[10]

**OR**

11. Explain Loss less and lossy predictive coding with necessary equations and diagrams.

[10]

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