

**Code No: 155BT****JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD****B. Tech III Year I Semester Examinations, March - 2024****IMAGE PROCESSING****(Computer Science and Engineering – Artificial Intelligence and Machine Learning)****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) Define Resolution. [2]
- b) List the applications of Image transform. [3]
- c) Define Histogram of Image. [2]
- d) What do you mean by Image Restoration? [3]
- e) Define unconstrained restoration. [2]
- f) List the properties of degradation model. [3]
- g) What is meant by edge linking? [2]
- h) Specify some fundamental conditions of segmentation. [3]
- i) What is image compression? [2]
- j) Why image compression is needed? [3]

**PART – B****(50 Marks)**

2. Discuss about image sampling and Quantization. [10]  
**OR**
3. Prove that both the 2-D continuous and discrete Fourier transforms are linear operations. [10]
4. Illustrate the concept of Histogram Equalization technique for Image enhancement. [10]  
**OR**
5. Discuss how the various filter masks are generated to sharpen images in spatial filters. [10]
6. Explain the concept of Inverse Filtering and also mention the limitations of it. [10]  
**OR**
7. What is the purpose of image restoration? Explain the model of image degradation and restoration process using suitable block diagram. [10]
8. Discuss about region-based segmentation in detail. [10]  
**OR**
9. Explain in detail edge linking using Hough transform. [10]
10. Draw the functional block diagram of general image compression system and explain it. [10]  
**OR**
11. With an example, explain Huffman coding. [10]