

Code No: 117CJ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, March - 2017

DIGITAL IMAGE PROCESSING

(Electronics and Communication Engineering)

Time: 3 Hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A. Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

Part- A (25 Marks)

- 1.a) Define image resolution. [2]
- b) What are the steps involved in DIP? [3]
- c) Specify the objective of image enhancement techniques. [2]
- d) Differentiate between linear spatial filter and non-linear spatial filter. [3]
- e) What is meant by image restoration? [2]
- f) What is inverse filtering? [3]
- g) Define region growing. [2]
- h) What are the three types of discontinuity in digital image? [3]
- i) Define huffman coding. [2]
- j) What are different compression methods? [3]

Part-B (50 Marks)

- 2.a) What is meant by digital image processing? What are the applications of it? How an image is represented digitally?
 - b) Non uniform sampling is useful for what type of images. Give reasons. [5+5]
- OR**
- 3.a) Is fast algorithm applicable for computation of Hadamard transform, if so what are the problems encountered in implementation.
 - b) Explain Discrete Cosine Transform and specify its properties. [5+5]
- 4.a) What is a histogram of an image? Sketch histograms of basic image types.
 - b) Discuss how histogram is useful for image enhancement. [5+5]
- OR**
5. What are the techniques used for image smoothing? Explain any one spatial and one frequency techniques used for image smoothing. [10]
 6. Describe constrained least square filtering technique for image restoration and derive its transfer function. [10]
- OR**
7. Describe with mathematical model, both constrained and unconstrained restoration. [10]

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- h) What are the three types of discontinuity in digital image? [3]
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Part-B (50 Marks)

- 2.a) What is meant by digital image processing? What are the applications of it? How an image is represented digitally?
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- OR**
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- 8.a) Explain the segmentation techniques that are based on finding the regions.
b) Write the applications of segmentation. [7+3]

OR

- 9.a) Explain any two methods for linking the edge pixels to form a boundary of an object.
b) Explain with examples morphological operations dilation and erosion. [7+3]

- 10.a) Explain the schematics of image compression standard JPEG.
b) Draw and explain a general compression system model. [5+5]

OR

- 11.a) Describe in detail the lossless predictive coding error free compression.
b) Explain briefly the transform based compression. [5+5]

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