

Code No: 117DU

R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, November/December - 2016

IMAGE PROCESSING AND PATTERN RECOGNITION

(Common to CSE, IT)

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 spatial and Grey level resolution of an image. [2]
- b) Let \mathbf{m} and \mathbf{n} be the pixels with coordinates (5,5) and (10, 5) respectively. Find out Which distance measure gives the minimum distance between pixels. [3]
- c) Explain the significance of Opening and Closing in morphological operations [2]
- d) What is meant by multilevel thresholding? [3]
- e) Name the different types of redundancies present in an image [2]
- f) Define Fidelity Criteria. [3]
- g) What is meant by Skeleton? [2]
- h) Define Signature. [3]
- i) Differentiate clustering and classification. [2]
- j) What is meant by Pattern? [3]

PART-B

(50 Marks)

- 2.a) Briefly explain the Image sampling and Quantization.
- b) What is meant by spatial filtering? Explain the significance of sharpening and smoothing filters for image enhancement. [5+5]

OR

- 3.a) What is the importance of image enhancement in image processing? Explain in brief any two-point processing techniques implemented in image processing.
- b) Explain the importance of image restoration process in image processing. Explain any four important noise probability density functions. [5+5]

- 4.a) Explain in detail the Hit or Miss transformation.
- b) Describe the edge linking and boundary detection methods. [5+5]

OR

- 5.a) Briefly discuss the basic global thresholding and basic adaptive thresholding processes used in image segmentation.
- b) Explain the Region splitting and Region Merging. [5+5]

- 6.a) Explain the two different types of image compression techniques and their applications.
- b) Differentiate between Lossless compression and Lossy compression. [5+5]

- 7.a) With a neat diagram explain the Lossy predictive coding.
b) Design an invisible water marking system based on Discrete Wavelet Transform. [5+5]

- 8.a) Explain briefly the chain codes.
b) Discuss the Relational descriptors. [5+5]

OR

- 9.a) Explain briefly the Boundary descriptors.
b) Explain the Regional descriptors. [5+5]

- 10.a) Briefly explain the K-means algorithm
b) With the help of suitable diagram explain classifiers and functional structure of general statistical pattern classifier. [5+5]

OR

- 11.a) Explain the concept of feature extraction in pattern recognition system with examples.
b) What are the challenges in Bayesian decision theory? [5+5]

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