

# CBCS SCHEME

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BANGALORE - 560 037

15TE655

## Sixth Semester B.E. Degree Examination, June/July 2018 Image Processing

Time: 3 hrs.

Max. Marks: 80

**Note:** Answer FIVE full questions, choosing one full question from each module.

### Module-1

- 1 a. Give examples of fields that use digital image processing. (06 Marks)  
b. With the help of a neat block diagram, explain the fundamental steps in digital image processing. (10 Marks)

OR

- 2 a. Write a plot of Weber ratio as a function of intensity and highlight its relevance. (04 Marks)  
b. What is digital image processing? Explain the basic concepts in sampling and quantization with diagrams. (06 Marks)  
c. Explain different distance measures used in digital image processing. (06 Marks)

### Module-2

- 3 a. Explain some basic intensity transformation functions with diagrams and equations. (10 Marks)  
b. Explain the mechanics of linear spatial filtering with diagram and equation for the response. (06 Marks)

OR

- 4 a. Explain the concept of intensity level slicing with diagrams. (06 Marks)  
b. State the assumptions for histogram equalization and specification along with reason for each assumption. (04 Marks)  
c. Explain spatial smoothing linear filters with masks. (06 Marks)

### Module-3

- 5 a. Explain any four properties of two dimensional discrete Fourier transform. (08 Marks)  
b. Explain any four important noise probability density functions with diagrams and equations. (08 Marks)

OR

- 6 a. Summarize the steps for filtering in the frequency domain. (06 Marks)  
b. Summarize the steps in homomorphic filtering with a block diagram. Write the cross section of such a filter. (04 Marks)  
c. Draw and explain the model of image degradation and restoration process. (06 Marks)

### Module-4

- 7 a. Explain the inverse filtering approach and its limitation in image restoration. (06 Marks)  
b. What is erosion? Explain the erosion operation in morphological processing with an example. (06 Marks)  
c. Explain how the Laplacian mask can be obtained for point detection. (04 Marks)

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- 8 a. Suggest any three important approaches to estimate the degradation function in image restoration. (03 Marks)
- b. What is dilation? Explain the dilation operation in morphological processing with an example. (06 Marks)
- c. Derive the masks for Roberts and Sobel operators and write their application. (07 Marks)

Module-5

- 9 a. Explain the basics of intensity thresholding using histograms for image segmentation. (08 Marks)
- b. Explain the basics of region splitting and merging for image segmentation. (08 Marks)

OR

- 10 a. Explain the role of noise in image thresholding. (04 Marks)
- b. Explain the Basic Global Thresholding approach for image segmentation. (06 Marks)
- c. Explain how chain codes can be used for boundary representation. (06 Marks)

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