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BICS-024

B.Tech. – VIEP – COMPUTER SCIENCE AND ENGINEERING (BTCSVI)

00787

Term-End Examination

December, 2017

BICS-024 : DIGITAL IMAGE PROCESSING

Time : 3 hours *Maximum Marks : 70*

Note : *Answer any* ***seven*** *questions. All questions carry equal marks.*

1. What are the important components of an image processing system ? Draw a proper diagram to exhibit the interrelation between the components. Explain the role of each component. *10*

2. Explain the term Histogram Equalization. Discuss the utility of histogram equalization in image processing. Why does discrete histogram equalization not, in general, yield a flat histogram ?

   Perform histogram equalization for L = 8 and n_k = [790, 1023, 850, 656, 329, 245, 122, 8]. *10*

3. Write short notes on the following types of images : *10*

   (a) Binary Image

   (b) Grayscale Image

   (c) True Colour Image

   (d) Indexed Image

4. What is Spatial Convolution ? What is the role of convolution in image processing ? Give two similarities and two differences between spatial convolution and spatial correlation. *10*

5. Differentiate between the following : *10*

   (a) Geometric and Fourier Transform

   (b) Global and Adaptive Thresholding

6. What is the need of transforming any image from spatial domain to frequency domain ? List the algorithms used to perform transformation from spatial domain to frequency domain. Explain the basis of filtering in frequency domain. Differentiate between low pass filters and high pass filters. *10*

7. What do you understand by the term Edge Detection ? What are the stages of edge detection ? Briefly discuss each stage of edge detection, with a suitable example. List the edge detection algorithm, and discuss any one of them. *10*

8. Briefly discuss the following with suitable example and diagram : *10*

   (a) Image enhancement in spatial domain

   (b) Image enhancement in frequency domain

9. Define and explain Dilation and Erosion operations with examples. Explain how region filling is achieved with these operations. Prove that erosion and dilation are dual transformations. *10*

10. What do you mean by Image Restoration ? Explain the degradation model in detail. Discuss the Minimum Mean-Square Error approach of Restoration. *10*