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BICS-024

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

00227

Term-End Examination

December, 2014

BICS-024 : DIGITAL IMAGE PROCESSING

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. Each question carries equal marks.*

1. Describe the various steps in image processing. Explain the structure of the human eye with the help of a diagram. *5+5*

2. What is meant by histogram ? Explain the steps in histogram specification. Perform histogram specification on the 8×8 image. The gray level distribution of the images are given below : *1+3+6*

Gray level (r_k)	No. of pixels (p_k)	
	H_a	H_b
0	8	0
1	10	0
2	10	0
3	2	0
4	12	20
5	16	20
6	4	16
7	2	8

3. Explain the basis of filtering in Frequency Domain. State and prove the Translation and Separability property of Discrete Fourier Transform. *2+4+4*

4. Explain the basic difference between image enhancement and image restoration. Given below is a 3×3 image. *4+6*

1	7	5
6	2	3
1	4	2

What will the value of centre pixel change to when this image is passed through :

(i) Arithmetic Mean Filter

(ii) Geometric Mean Filter

(iii) Harmonic Mean Filter

(iv) Max Filter

5. Explain the HSV colour model and compare it with RGB and CMY colour models. Discuss the advantages and disadvantages of these colour models. *10*

6. Define and explain Dilation and Erosion operations with example. Explain how Region filling is achieved with these operations. *6+4*

7. What do you mean by registration ? Explain the Geometrical transformation. *5+5*

8. What is thresholding ? What are the different types of thresholding ? Write an algorithm to set the Global Thresholding Value. *2+4+4*

9. What is an Edge ? Explain the Canny Optimal Edge Detection method with example. *3+7*

10. Write short notes on the following : *4+3+3*

    (i) Chain Codes

    (ii) Graph Matching

    (iii) Statistical Moments