

USN

--	--	--	--	--	--	--	--	--	--

06CS/IS762

Seventh Semester B.E. Degree Examination, June/July 2013

Digital Image Processing

Time: 3 hrs.

Max. Marks:100

Note: Answer FIVE full questions, selecting at least TWO questions from each part.

PART – A

- 1 a. Comprehend the components of digital image processing with a diagram. (08 Marks)
- b. What are the connectivity between the pixels in image processing? Mention the suitable example for each of them. (12 Marks)
- 2 a. What is Histogram matching? Provide the complete algorithm to perform the same. (10 Marks)
- b. Demonstrate the mechanism of spatial filtering with 3×3 mask with the suitable image section directly under it. (10 Marks)
- 3 a. List the correspondence between filtering in the spatial frequency domain. (06 Marks)
- b. Explain the Butterworth highpass filter. (06 Marks)
- c. Describe the homomorphic filtering approach for image enhancement. (08 Marks)
- 4 a. What is white noise? Narrate any three noise probability density functions. (06 Marks)
- b. Name any three noise reduction spatial filter and briefly explain them. (07 Marks)
- c. Illustrate different periodic noise reduction technique by frequency domain. (07 Marks)

PART – B

- 5 a. What is chromaticity? Show the expression to compute the trichromatic coefficients. (06 Marks)
- b. Derive the expression to convert colours from RGB to HIS and visa-versa. (08 Marks)
- c. Define colour complements and briefly explain colour slicing. (06 Marks)
- 6 a. What is structured element? Explain any three of them. (06 Marks)
- b. Perform dilation operation $X \oplus B$ where $X = \{(1, 0), (1, 1), (1, 2), (2, 2), (0, 3), (0, 6)\}$ and $B = \{(0, 0), (1, 0)\}$. (06 Marks)
- c. Define opening morphological operation. Compute the erosion $X \ominus B$ where $X = \{(1, 0), (1, 1), (1, 2), (0, 3), (1, 3), (2, 3), (3, 3), (1, 4)\}$ and $B = \{(0, 0), (1, 0)\}$. (08 Marks)
- 7 a. Name type of the gray level discontinuities in digital image, illustrate any two of them. (08 Marks)
- b. Develop a segmentation algorithm with region based strategy. (06 Marks)
- c. What is skeletonizing? Explain the strategy with an example. (06 Marks)
- 8 a. Write an algorithm to compute the principal component to describe the image. (10 Marks)
- b. What is pattern class? Explain the concept of object matching via the correlation coefficient. (10 Marks)

* * * * *

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. $42+8=50$, will be treated as malpractice.