

16292(D) - 0 DEC 2016

B. Tech 8th Semester Examination

Digital Image Processing (NS)

EC-421(c)

Time : 3 Hours

Max. Marks : 100

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions selecting one question from each section A, B, C and D. Question 9 is compulsory.

SECTION - A

1. Determine the resolution (pixels per centimeter) in the x and y directions for the video monitor in use on your system. Determine the aspect ratio, and explain how relative proportions of objects can be maintained on your system. (20)
2. Explain in detail the histogram equalization technique for image enhancement. Write short notes on:
 - (a) Contrast stretching
 - (b) Gray level slicing
 - (c) Bit plane slicing (20)

SECTION - B

3. Write the equations for discrete Fourier Transform for one-dimensional and two dimensional functions for images. List out the important properties of the two-dimensional Fourier transform. (20)
4. Explain the Walsh Hadamard transform class of Fourier transform. What is computational complexity and area of application where these transforms can be applied? (20)

SECTION - C

5. In order to have a restored image we have to apply different types of filtering such as inverse filtering, wiener filtering etc. Explain these filtering methods which are helpful in restoration of images. (20)
6. Explain in detail the histogram equalization technique for image enhancement. Draw the histogram for four basic types. (20)

SECTION - D

7. Differentiate between Lossy compression and loseless compression. Describe at least one technique for each compression technique. (20)
8. What is the role of gradient operator and Laplacian operator in segmentation? Distinguish between global, local and dynamic thresholding. (20)

SECTION - E

9. Answer short answer type questions:
 - (a) Give the mathematical model of a digital image.
 - (b) Write the Prewitt and Sobel operator mask.
 - (c) What is the advantage of using homomorphic filtering?
 - (d) What are the types of redundancies normally available in an image?
 - (e) What is vector quantization?
 - (f) What is gray level interpolation?
 - (g) Mention three important characteristics used to distinguish one color from another color.
 - (h) Why do we need image representation?
 - (i) Why do we need discriminant functions?
 - (j) How will you increase the chain code accuracy?
(10×2=20)