

CBCS SCHEME

USNning Resource Centre
Acharya Institute & Technology

15EC72

Seventh Semester B.E. Degree Examination, Feb./Mar. 2022

Digital Image Processing

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. What is digital image processing? With the help of neat block diagram. Explain the components of a general purpose image processing system. (10 Marks)
b. Explain image formation in an eye. (06 Marks)

OR

- 2 a. Explain the process of image sampling and Quantization in the digital image formation. (08 Marks)
b. Explain spatial resolution and gray level resolution. (04 Marks)
c. Let p and q be two pixels at co-ordinates (10, 15) and (15, 25) respectively. Find out which distance measure give the minimum distance between pixels. (04 Marks)

Module-2

- 3 a. Explain the smoothing of images in Frequency domain using:
i) Ideal lowpass filter
ii) Butterworth lowpass filter. (08 Marks)
b. Explain Log transformation and Gamma transformation functions for image enhancement in the spatial domain. (08 Marks)

OR

- 4 a. Define 2-D forward and inverse discrete Fourier transform and mention its properties. (08 Marks)
b. With the help of a block diagram, explain homomorphic filtering approach in the image enhancement. (08 Marks)

Module-3

- 5 a. Explain any four noise probability density functions. (08 Marks)
b. What is order statistic filters? Explain any three of them. (08 Marks)

OR

- 6 a. What are the three methods of estimating the degradation function? Explain any two of them. (08 Marks)
b. Explain Weiner filtering and constrained least squares filtering in image restoration system. (08 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.

Module-4

- 7 a. With the help of neat diagram, explain RGB color model, and write the equations to convert RGB to CMY. (08 Marks)
- b. What do you mean by Pseudo color image processing? And also explain Intensity to color transformations. (08 Marks)

OR

- 8 a. Explain the following :
- i) Erosin
 - ii) Dialation
 - iii) Opening and closing
 - iv) Hit-or miss Transform. (08 Marks)
- b. Explain boundary extraction algorithm using morphological operator. (08 Marks)

Module-5

- 9 a. What is image segmentation? Explain First-order derivatives used in edge detection. (08 Marks)
- b. Explain the region based approach of segmentation. (08 Marks)

OR

- 10 a. Briefly explain any two types of boundary descriptors. (08 Marks)
- b. Briefly explain any two types of regional descriptors. (08 Marks)

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