



CBCS SCHEME

17EC72

Seventh Semester B.E. Degree Examination, June/July 2023 Digital Image Processing

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- 1 a. Define sampling and quantization of digital images. Give reasons for blocking artifacts and false contouring in an image. (08 Marks)
- b. Find the item required to transmit a monochrome image of size $2.5'' \times 2.5''$, seamed at 150 DPI and to be sent at 28 KBPS speed with 256 intensity levels. (04 Marks)
- c. Explain with neat diagram, how image is acquired using sensor strips. (08 Marks)

OR

- 2 a. With a neat diagram, explain the fundamental steps in digital image processing (08 Marks)
- b. Explain the following terms as applicable to image processing with necessary graphs.
 - i) Brightness adaptation
 - ii) Brightness discrimination. (06 Marks)
- c. Find the Euclidean, chess board and Manhattan distances between two pixels P(100, 120) and q(130, 160). (06 Marks)

Module-2

- 3 a. With necessary transformation graphs, explain the following with an example :
 - i) Image negative
 - ii) Bit plane slicing. (06 Marks)
- b. The following table gives the number of pixels at each of the grey levels from 0 to 7 in an image.

Gray level r_k	0	1	2	3	4	5	6	7
Number of pixels P_k	30	50	100	1500	2300	4000	200	20

Draw histogram corresponding to these grey levels. Perform histogram equalization and draw resulting histogram. (08 Marks)

- c. Explain with the block diagram, the basic steps for image filtering in frequency domain. (06 Marks)

OR

- 4 a. Develop a procedure to perform histogram matching. (06 Marks)
- b. Explain homomorphism filters for image enhancement with necessary equations and block diagram. (08 Marks)
- c. Explain the sharpening of images in frequency domain using Butterworth high pass and Gaussian high pass filter. (06 Marks)

Module-3

- 5 a. Explain the basic model of image restoration process, and also explain any four noise probability density functions. (12 Marks)
- b. Explain adaptive median filter algorithm in detail. (08 Marks)

