

CBCS SCHEME



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17EC72

Seventh Semester B.E. Degree Examination, July/August 2022

Digital Image Processing

Time: 3 hrs.

Max. Marks: 100

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

Module-1

- a. Explain the fundamental steps in digital image processing. (10 Marks)
b. Explain various image sensing and acquisition methods. (10 Marks)

OR

- a. Explain the process of image sampling and quantization in digital image processing. (08 Marks)
b. Explain the significance of isoference curve in an image processing. (06 Marks)
c. Consider the image segment shown in Fig.Q2(c). Let $V = \{1, 2\}$ and compute the length of the shortest 4-, 8- and m-path between p and q. If particular path does not exist between these two points, explain why?

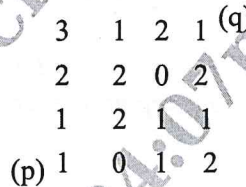


Fig.Q2(c)

(06 Marks)

Module-2

- a. Explain the widely used gray level transformations. (10 Marks)
b. Perform histogram equalization of the image shown in Fig.Q3(b), where the intensity levels are integers in the range $[0, 9]$.

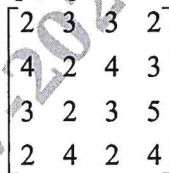


Fig.Q3(b)

(10 Marks)

OR

- a. Explain the development of digital Laplacian method used for image enhancement. (10 Marks)
b. Explain the procedure used in frequency domain for simultaneous gray level range compression and contrast enhancement. (10 Marks)

Module-3

- a. Discuss how periodic noise can be reduced by frequency domain filtering. (10 Marks)
b. Explain the ordered statistic filter's used for image restoration. (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.

OR

- 6 a. Explain the following methods to estimate the degradation function used in image restoration:
(i) Estimation by image observation.
(ii) Estimation by experiment (10 Marks)
- b. Explain the Wiener filtering method of restoring images in presence of noise and blur. (10 Marks)

Module-4

- 7 a. Explain the procedure in converting colors from HSI to RGB. (10 Marks)
- b. Explain the relationship between scaling and wavelet function spaces. (10 Marks)

OR

- 8 a. Explain in brief the techniques used for pseudocolour image processing. (10 Marks)
- b. Describe in brief the following terms:
(i) Morphological hit-or-miss transform
(ii) Morphological opening and closing. (10 Marks)

Module-5

- 9 a. Discuss various masks used to compute the gradient of an image. (10 Marks)
- b. Explain region splitting and merging. (10 Marks)

OR

- 10 a. Explain the following image representation techniques:
(i) Signatures
(ii) Skeletons (10 Marks)
- b. Discuss segmentation using morphological watersheds. (10 Marks)

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