S.No. : 468 BCACSN 15303

No. of Printed Pages : 04

Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 26425 Roll No. 1 2 3 0 2 6 4 0 2 8

BCA Examination, 2025-26

(Odd Semester)

DIGITAL IMAGE PROCESSING

Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION – A

1. Attempt all parts of the following : 8×1=8

   (a) Define digital image.

   (b) What is meant by image sampling?

   (c) What is a filter?

   (d) What is spatial filtering?

   (e) What is image restoration?

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(f) What is image segmentation?

(g) Define erosion.

(h) Define dilation.

SECTION – B

2. Attempt any two parts of the following : 2×6=12

(a) Explain the steps involved in digital image processing system with a neat block diagram.

(b) Explain various gray-level transformation techniques used for image enhancement with examples.

(c) Discuss the image degradation model and discuss different noise models.

(d) Define and explain morphological image processing operations.

SECTION – C

Note :– Attempt all questions. Attempt any two parts from each questions. 8×5=40

3. (a) Explain image sampling and quantization in detail.

(b) Explain 2D discrete fourier transform.

(c) Compare the RGB and HSI color models with diagram.

4. (a) Discuss histogram equalization and histogram specification with example.

(b) Derive and explain the spatial filtering process, give example.

(c) Explain the use of fourier transform in frequency-domain enhancement.

5. (a) Discuss the working and applications of order-statistics filters in image restoration.

(b) Compare the performance of band-reject, band-pass and notch filters for noise removal.

(c) Explain inverse filtering and discuss its limitations.

6. (a) Describe various edge detection techniques with mathematical formulations.

(b) Discuss region bases segmentation methods with flow charts.

(c) Discuss thresholding based segmentation methods and their limitations.

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