WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 6th Semester Examination, 2022

CMSADSE05T-COMPUTER SCIENCE (DSE3/4)

Time Allotted: 2 Hours   Full Marks: 40

The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.

GROUP-A

1.   Answer any *four* questions from the following: 2×4 = 8

   (a) What do you mean by image resolution?   2

   (b) Differentiate between image enhancement and image restoration.   2

   (c) What do you mean by 8- connected neighbours of a pixel?   2

   (d) What is contrast stretching?   2

   (e) What is the need of compression?   2

   (f) What is image enhancement? Why is it needed?   1+1 = 2

   (g) What is edge in an image?   2

GROUP-B

Answer any *four* questions from the following   8×4 = 32

2.   Describe histogram equalization. Obtain histogram equalization for the   8
       following image segment of size 5×5.

$$\begin{bmatrix} 4 & 4 & 4 & 4 & 4 \\ 3 & 4 & 5 & 4 & 3 \\ 3 & 5 & 5 & 5 & 3 \\ 3 & 4 & 5 & 4 & 3 \\ 4 & 4 & 4 & 4 & 4 \end{bmatrix}$$

3. (a) Write the purposes of image processing.   2+6 = 8

   (b) List the steps involved in digital image processing and explain them in brief.

4. (a) Illustrate Sampling and Quantization of an image.   (2+2)+4 = 8

   (b) Discuss image negative transformation.

5. (a) Discuss about spatial domain and frequency domain filtering briefly. 4+4 = 8

   (b) Differentiate between low-pass and high-pass filter.

6. (a) Explain four arithmetic and logical operations on image. 4+4

   (b) Explain the operation of Region growing approach for image segmentations.

7. (a) Write different causes of image degradation. 2+4+2 = 8

   (b) Explain image degradation and restoration model in brief.

   (c) Differentiate between linear and non linear spatial filters.

8.   Write short notes on: (any *two*) 4×2 = 8

   (a) Discrete Fourier Transform

   (b) Edge Detection

   (c) Image watermarking.

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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