लक्ष्यं विधमानम्

WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 6th Semester Examination, 2023

CMSADSE05T-COMPUTER SCIENCE (DSE3/4)

DIGITAL IMAGE PROCESSING

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.
All symbols are of usual significance.

GROUP-A

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

(a) What do you mean by blurring in image processing?

(b) What do you mean by simultaneous contrast?

(c) What is the difference between frequency domain and spatial domain method?

(d) Define run length coding.

(e) Illustrate sampling and quantization.

(f) What is the function of image sensor?

(g) What do you mean by digital image watermarking?

GROUP-B

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

2. Explain the various image enhancement techniques performed in spatial domain. What is the need of image compression? 6+2

3. Explain the term histogram specification and histogram equalization. Given histogram (a) and (b), modify histogram (a) as given by histogram (b). 4+4

Gray Level	0	1	2	3	4	5	6	7
No. of pixels	790	1023	850	656	329	245	122	81

Fig (a)

Gray Level	0	1	2	3	4	5	6	7
No. of pixels	0	0	0	614	819	1230	819	614

Fig (b)

4. How contrast stretching and intensity level slicing is performed on an image? Explain. What do you mean by salt and pepper noise? 6+2

5. (a) What is the purpose of Image Restoration? Explain the model of Image Degradation and Restoration process using suitable block diagram. (2+4)+2

(b) Explain the purpose of Adaptive Filter in image processing.

6. (a) Write down an algorithm to extract boundary of a binary image using morphological operations. 4+4

(b) What do you mean by morphological gradient for an image?

7. (a) What is Image Segmentation? What is the edge detection process in Image Segmentation? (2+2)+4

(b) Explain Edge Linking using Hough Transform.

8. Write short notes on: (any *two*) 4+4

(a) Wavelet Transform

(b) Huffman Coding

(c) Lossy Compression

(d) Two Dimensional Discrete Fourier Transform.

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