



WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 6th Semester Examination, 2021

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 gray level?
 - (b) Explain brightness.
 - (c) Differentiate between classification and clustering.
 - (d) Mention any two goals of digital image processing.
 - (e) What do you understand by neighbours of a pixel?
 - (f) What do you mean by salt-and-pepper noise?
 - (g) Define image enhancement. Why is it important in image processing?
 - (h) Mention the difference between monochrome and gray-scale image.

GROUP-B

Answer any four questions from the following

8×4 = 32

2. (a) Illustrate sampling and quantization of an image. 2+2
- (b) Discuss the image negative transformation. 4
3. Explain the basis of filtering in Spatial domain and Frequency domain. 5+3
Differentiate between Low-pass filter and High-pass filter.
4. What is Image Segmentation? Explain the process of Image Segmentation using 2+6
Region Growing, Region Splitting and Region Merging.
5. Explain the terms Histogram Specification and Histogram Equalization. State and 4+4
prove the separability property of Discrete Fourier Transform.

6. (a) Define Run length coding. 2
(b) Construct the Huffman tree for the word 'COMMITTEE'. 6
7. (a) What is JPEG? What are the coding systems in JPEG? 3
(b) State Shannon's theorem. Explain Edge Detection in detail. 2+3
8. Write short notes on: (any *two*) 4+4
(a) Fourier Transform
(b) Image watermarking
(c) Thresholding
(d) Image degradation.

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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