

2021

COMPUTER SCIENCE — HONOURS

Paper : DSE-A-1

(Digital Images Processing)

Full Marks : 50

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer **question number 1** and **any four** from the rest.

1. Answer **any five** questions : 2×5
- (a) What is sampling?
 - (b) What are the hue and saturation?
 - (c) What do you mean by image negative?
 - (d) What do you mean by image enhancement?
 - (e) What is a median filter?
 - (f) How a digital image can be converted into negative?
 - (g) Find the Euclidean distance between two pixels P (134, 145) and Q (20, 112).
 - (h) Write down four different storage file extensions of digital images.
2. (a) Why sampling and quantization are required in image processing?
(b) Explain, in brief, about local and global thresholding method.
(c) Discuss about intensity level slicing operation. 4+4+2
3. (a) Explain the concept of geometric transformation for image restoration.
(b) Discuss the following relationships between pixels with neat diagrams :
(i) Neighbours of a pixel
(ii) Distance measures
(iii) Path. 4+6
4. (a) Discuss about applications of image subtraction and image multiplication operations.
(b) Write the mask for Prewitt and sobel operator.
(c) How log transformation function can be used for changing intensity values of pixels? Explain clearly. 3+3+4

Please Turn Over

- 5. (a) Explain Hough Transformation. Explain its utility.
(b) Define spatial filtering. 5+2+3

- 6. Write short notes on the following : 5+5
 - (a) Canny edge detection
 - (b) Region growing.

- 7. (a) Discuss about Intensity Level Slicing operation.
(b) What is the difference between an RGB image and a grey image? How an RGB image can be converted to grey? 4+6

- 8. (a) Why histogram equalization is required for digital image processing?
(b) Equalize the following histogram : 5+5

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