Surendranath College
M.Sc. in Computer Science
Mid-Semester Examination, 2023-24
Semester: III
Paper Name: Image Processing and Pattern recognition
Paper Code: CSME301

Full Marks: 30

Time: 1 Hr

<Answer any six questions out of eight. Each question carries 5 marks>

1. How to compute Chess board distance between two pixels? Distinguish between digital image and binary image. Give suitable example to each type of images. An image segment is shown below. Compute D4 and D8 distances between pixel 'p' and 'q' where p = {0,0} and q = {3,3}

2	3	2	6
6	2	3	6
5	3	2	3
2	4	3	5

1+1+3

2. (a) What do you mean by image sampling and quantization? (b) Why is m-adjacency beneficial than 8-adjacency? (c) Two gray level images are X-ORed to obtain a total black resultant image. What is your conclusion about the input images?

2+2+1

3. (a) What is dynamic range? (b) Write the expression to find the number of bits to store a digital Image?

1+4

4. (a) Define image negatives. (b) Illustrate image negatives graphically. (c) Obtain the negative of the following 8-bit per pixel image. 1+1+3

137	205	105
141	252	97
201	19	76

5. (a) Can an image be blurred after noise removal? (b) Write an algorithm to form histogram of a MXN gray level image.

2+3

6. (a) How maximum possible intensity value in an image is determined? (b) Given the following grey image find each of its pixel intensity after histogram equalization is performed.

1+4

75	60	57
60	60	75
75	65	75

7. (a) What is digital image? (b) What is a frame buffer? Given below is a 3x3 image. (b) What will be the new value of Centre pixel when this image is passed through mean filter?

7	7	4
6	4	3
1	0	7

2+2+1

8. Write an algorithm to create a binary image with a *thick black* diagonal. The rest of the image will be white.