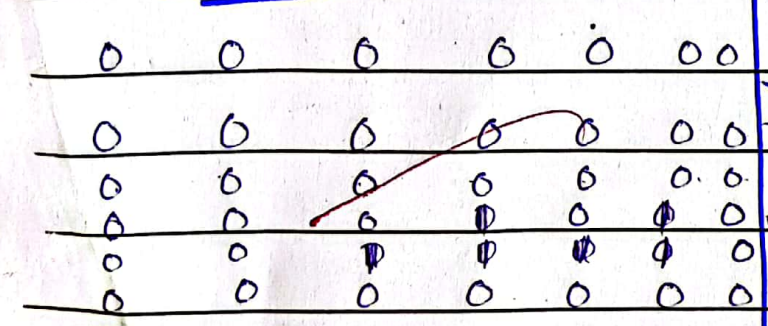
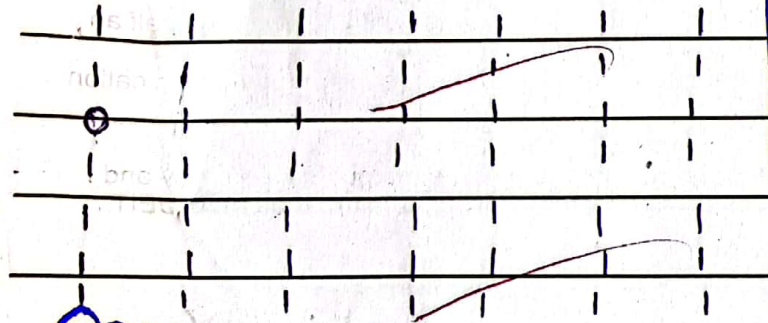
Start writing from below this line

Q3

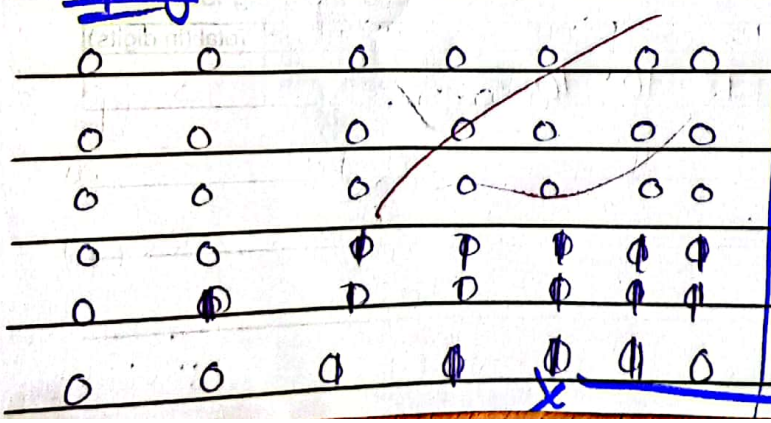
Erusion :-



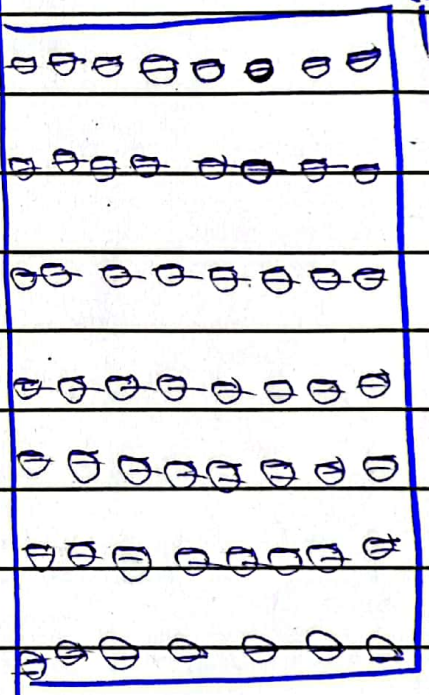
Dialtion



Openg :-



Visio



Ans

17

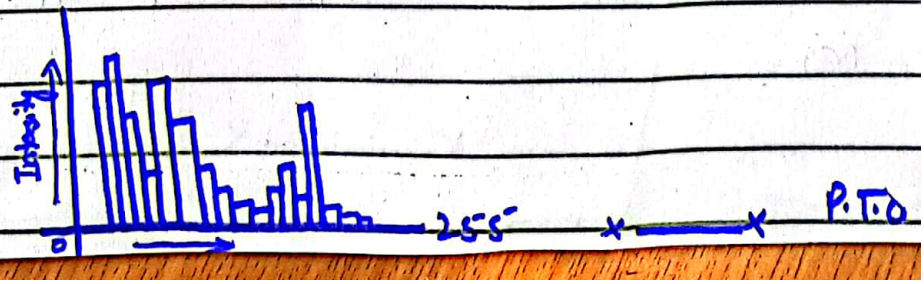
Question # 1

1) Thresholding:

Thresholding is a Technique of doing segmentation of an image. It differenciates the pixel values of the same manner at the edges of an image. Thresholding of a grayscale image gives the prominent pixel value at various points.

2) Histogram:-

It is the plot of intensity values of a grascale image. Its values suffer from 0 → 255. "0" means full black and 255 means full bright. The inbetween pixels are called shades of gray.

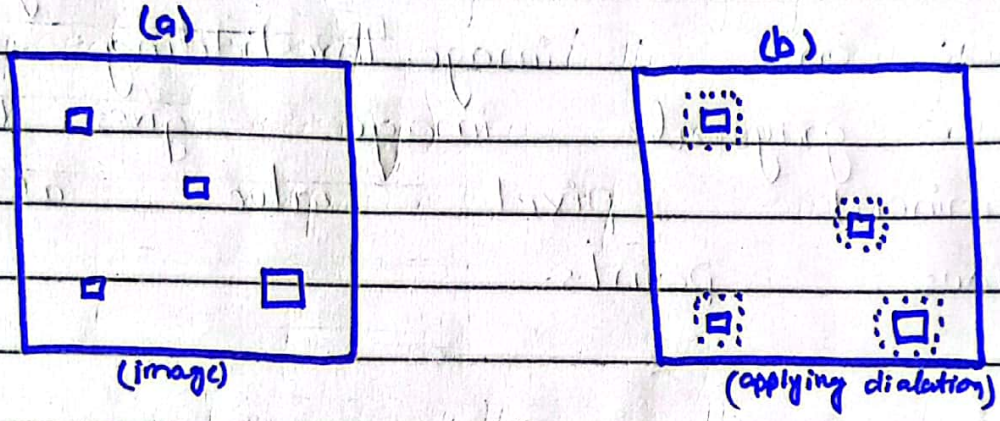


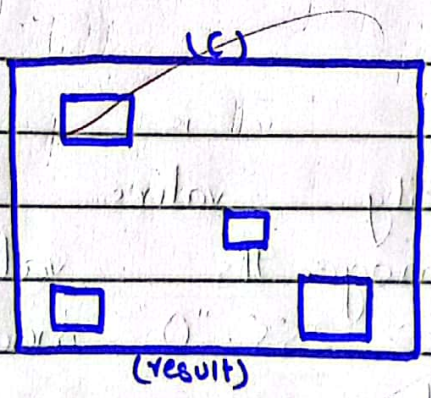
P.T.O

3) Dialation Operation:-

Dialation operation is a morphological operation performed on an image to increase the pixel value of white small pixel on their boundaries.

i.e.





(a) is an image when we applied dialation as show in (b) it will results in (c).

P.T.O

4) Opening Operation:-

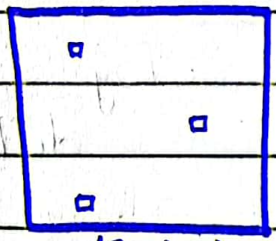
Opening operation is a morphological operation which is done by performing dialation followed by Eursion. It is used to eleminate the small white pixels surrounded by black pixels.

i.e

(a)

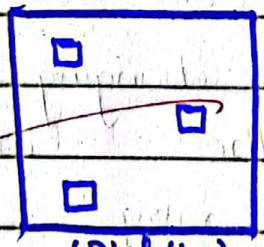
(image)

(b)



(Eursion)

(c)



(Dialation)

In opening we apply Eursion then dialution an (c) is the resultant.

P.T.O

(5) Ways of Camera Exp:-

These are the following ways to "(way)" vary camera exposure.

- **Shutter Speed:-**
  By changing the speed of shutter (increasing or decreasing) we can vary the exposure of camera.

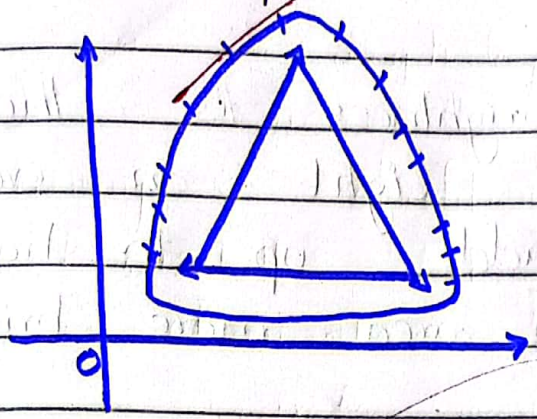
- **Aperture:-**
  By setting the aperture at different positions we can vary the camera exposure as well.

- **ISO:-**
  By changing the value of ISO the exposure of camera may vary.

6) Chromaticity:-

C.I.E chromaticity

diagram is the value of chromatic pixels to show in a 2D plane.



It is achieved by taking the 2D measurement of chromes from any image or video processed by the plane.

7) **Terms:-**

- **Radiance:-**

Radiance is the light or flouriscents which is reflected. It is measured in watts.

- **Luminance:-**

It is the light absorbed by the object or

human eye or anything.

Brightness:-

Brightness is the value of light on every pixel. It adds up to show the dark area more bright.

x ——— x

8) Effect of size of A.K:-

The effect of increasing size of averaging kernel with remove the details from any image as your increase the value. It blurs the edges of image by smothing and removes the details from image.

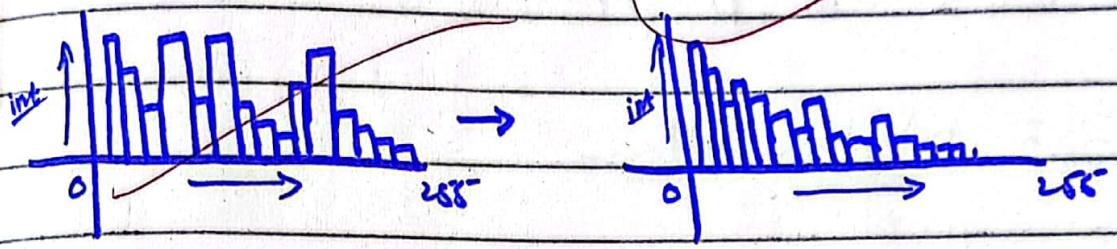
x ——— x

9) Histogram Equalization:-

Histogram equalization is a technique which is used to enhance the

image by equalizing their histograms.
Matlab function to use for histogram equalization is;

∴ histeq ( )



(a) (b)

Question # 2

i)

* Apply 3×3 median filter after zero padding

Zero padding:-

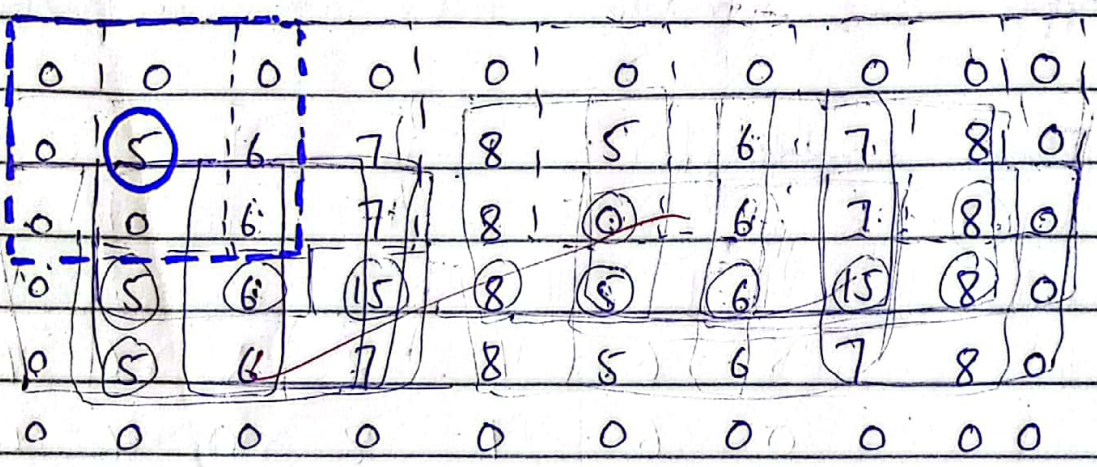
5	6	7	8	5	6	7	8
0	6	7	8	0	6	7	8
5	6	15	8	5	6	15	8
5	6	7	8	5	6	7	8

0	0	0	0	0	0	0	0	0	0
0	5	6	7	8	5	6	7	8	0
0	0	6	7	8	0	6	7	8	0
0	5	6	15	8	5	6	15	8	0
0	5	6	7	8	5	6	7	8	0
0	0	0	0	0	0	0	0	0	0

3x3 Median Filter:-

$f(x,y)$ = median filter is alway empty.

lets apply



we can solve also with salt & pepper

1) * for 1st value

0, 0, 0, 0, 5, 6, 0, 0 6

Let order it in Asc...

0, 0, 0, 0, 0, 0, 5, 6, 6

So the origin value will be;

median = 0

2) * Next

0, 0, 0, 5, 6, 7, 0, 6, 7

0, 0, 0, 0, 5, 6, 6, 7, 7

↑

meadian = 5

3) Next

0, 0, 0, 6, 7, 8, 6, 7, 8

0, 0, 0, 6, 6, 7, 7, 8, 8

↑

median = 6

4) 0, 0, 0, 7, 8, 5, 7, 8, 0

0, 0, 0, 0, 5, 7, 7, 8, 8

↑

median = 5

5) 0, 0, 0, 8, 5, 6, 8, 0, 6

0, 0, 0, 0, 5, 6, 6, 8, 8 median = 5

↑

6) 0, 0, 0, 5, 6, 7, 0, 6, 7

0, 0, 0, 0, 5, 6, 6, 7, 7

median = 5

7) 0, 0, 0, 6, 7, 8, 6, 7, 8

0, 0, 0, 6, 6, 7, 7, 8, 8

median = 6

8) 0, 0, 0, 7, 8, 0, 7, 8, 0

0, 0, 0, 0, 0, 7, 7, 8, 8

median = 0

15

Following same pattern and salt & Pepper concept.

Resultant Image:-

0	5	6	5	5	5	6	0
5	6	7	7	6	6	7	7
5	6	7	7	6	6	7	7
0	5	6	5	5	5	6	0

x ——— x

(ii)

3x3 Sharpening kernel.

0	0	0	0	0	0	0	0	0
0	5	6	7	8	5	6	7	8
0	0	6	7	8	0	6	7	8
0	5	6	15	8	5	6	15	8
0	5	6	7	8	5	6	7	8
0	0	0	0	0	0	0	0	0

Kernel = $\frac{1}{9}$

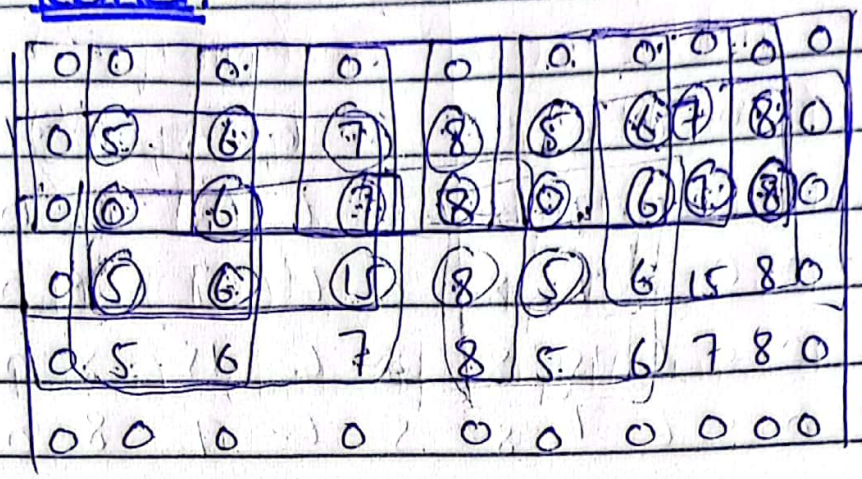
5/9	6/9	7/9	8/9	5/9	6/9	7/9	8/9
0/9	6/9	7/9	8/9	0/9	6/9	7/9	8/9
5/9	6/9	15/9	8/9	5/9	6/9	15/9	8/9
5/9	6/9	7/9	8/9	5/9	6/9	7/9	8/9

And - - - -

P.T.O →

(iii)

Bluring kernel:-



Bluring or ~~Averaging~~ ~~kernel~~

$$= \frac{1}{9}\begin{bmatrix} 0 & 1 & 0 \\ 1 & -4 & 1 \\ 0 & 1 & 0 \end{bmatrix}$$

OR

$$= \begin{bmatrix} 1/9 & 1/9 & 1/9 \\ 1/9 & 1/9 & 1/9 \\ 1/9 & 1/9 & 1/9 \end{bmatrix} \times$$

$$\begin{bmatrix} 0 & 1 & 0 \\ 1 & -4 & 1 \\ 0 & 1 & 0 \end{bmatrix}$$

Result:-

-14	-6	-7	-12	-6	-7	-17
16	-5	8	-9	-5	-8	-9
-9	8	-17	4	8	-17	4
-14	-6	-7	-12	-6	-7	-17

(iv)

Kernel:-

$$G_x = \begin{bmatrix} 1 & 2 & -1 \\ 2 & 4 & -2 \\ 1 & 2 & -1 \end{bmatrix}$$

$$G_y = \begin{bmatrix} 1 & 0 & 1 \\ 2 & 0 & 2 \\ 1 & 0 & 1 \end{bmatrix}$$

$$A \begin{bmatrix} 0 & 1 & 0 \\ 1 & 1 & 1 \\ 1 & 0 & 1 \end{bmatrix}$$

$G = \sqrt{G_x^2 + G_y^2}$ Threshold =

$A = \begin{bmatrix} G \geq T & 0 \\ G < T & 1 \end{bmatrix}$

Q4:-

```
clc, clearall
i1 = imread ('img1.png');
i2 = imread ('img2.Png');
a = im2double (i1);
b = im2double ((i2));
array = [(100:a), (b:100)]
```

```
res1 = imsub [a, b]
res2 = imsub [b, a]
subplot (3, 3, 1); imshow(a)
subplot (3,3,2); imshow (b)
subplot (3,3,3); imshow (res1)
subplot (3,1,1); imshow (res2)
```

Q5:-

```
clearall; clc, clearall;
im = imread (test.png);
im1 = convert2grayscal (im);
arr = double (im1);
a1 = histogram (im1);
a2 = histogram (arr);
```

```
subplot (2,1,1); imshow(a1)
subplot (2,1,2); imshow(a2)
if a2 ≥ 0
  Print ("Bright")
else
  Print ("dark")
```

Q6

```
clear all, clc, clear all,
a1 = imread (img1.Png)
a2 = imread (img2.Png)
readpix [(a1, a2)]
```

```
cont = cont (a1:9)
imshow (cont)
end;
```

Q7

```
a1 = imread (img.Png)
a2 = eursing (a1)
a3 = diattion (a2)
```

```
imshow (a3)
end.
```