IMAGE PROCESSING

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ROLL NO: 49

Class: 8th (Morning)

Batch: 21

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SUBMITTED TO: Dr. Sir Habib

Q No (1)

Ans (i)

a = [1 -2 3 1]; a = 1 -2 3 -1

b = [2 4 -1 -3]; b = 2 4 -1 3

= 2 + (-3) + (-3) + (-1)

= 6 + (-3) + (-1)

=> dot (a, b)

= -12.

(ii)

Ans: Image and Image.

(iii)

Ans: The Size required for an Image of Size 1024 x 1024 and intensity of 24 bit will be

width ← 1024 x 1024 → height = 1048576 bit

1048576 x 24 = 2516824 bit

= 3145728 byte (intensity).

= 3072 kb

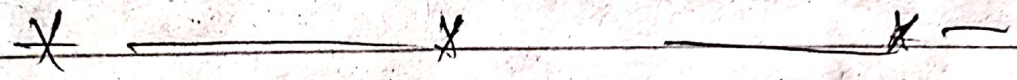
= 3 mb.

(iv)

Ans: = $(x+1, y)$, $(x-1, y)$, $(x, y+1)$, $(x, y-1)$, $(x-1, y+1)$, $(x+1, y-1)$, $(x-1, y+1)$, $(x-1, y-1)$.

(v)

Ans 2 In 2-distance measurement, system distance between the center pixel and a center pixel is 2 block.



Q NO (2)

Sampling and Quantization:-

Sampling term is related to co-ordinates value, According to the Nyquist frequency. while Quantization is related to ims intensity value.

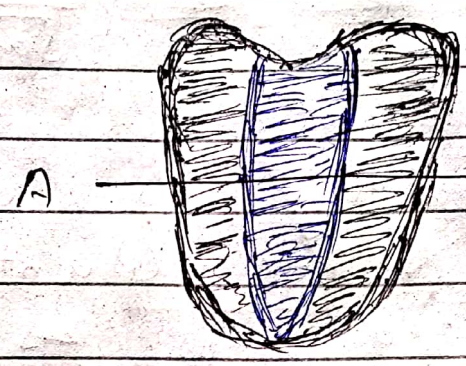
In order to become suitable for digital processing, an image function f(x,y), must be digitized both Spatialy ed in amplitude.

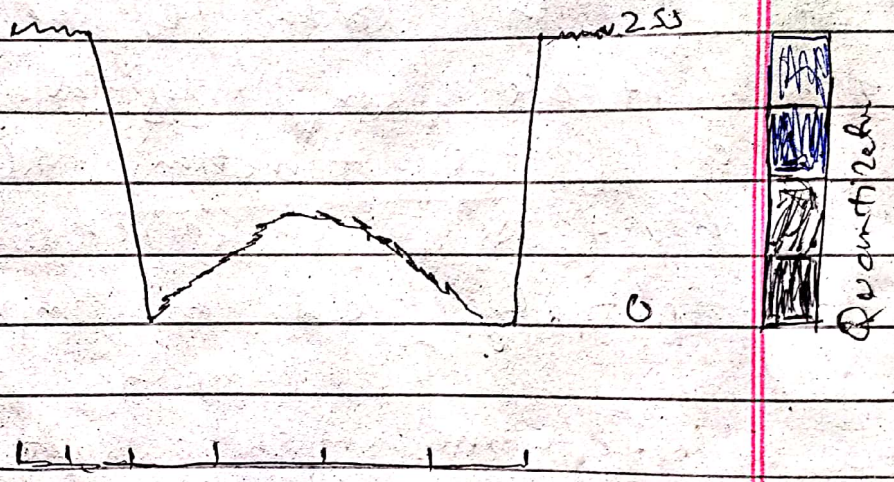
The sampling rate determines the Spatial resolution of the digitized image, while the Quantization level determines the Number of grey levels in a digitized image.

A magnitude of the Sampling image is expressed is a digital value in image process.

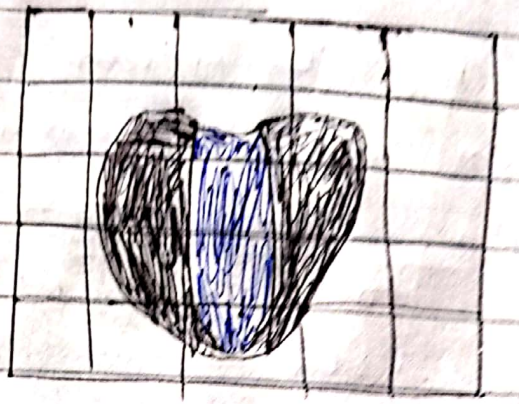
→

Diagrams:

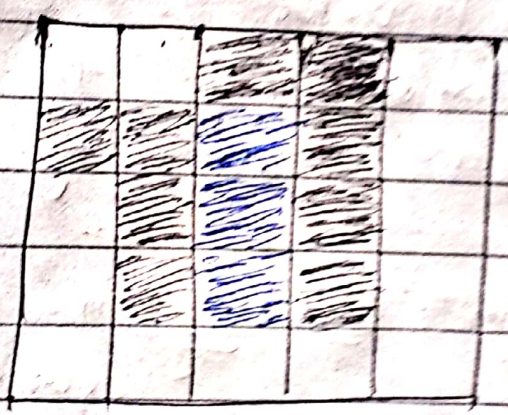




Sampling.



ANALOG IMAGE



Digital Image

Q NO (3)

Histogram:- The Histogram of an image normally refers to the ~~Histo~~ histogram to the pixel intensity values.

The histogram function is defined over all possible intensity levels. For each intensity level, its value is equal to the Number of the pixels with that intensity.

Histogram Equalization:- Histogram Equalization is used to enhance contrast. it accomplishes this by effectively spreading out the most frequent intensity values. This method usually increase the global contrast of images when its usable data is represented by close contrast values.

Example of the Histogram Equalization of the Image.

Lets,

$f(x,y)$ =

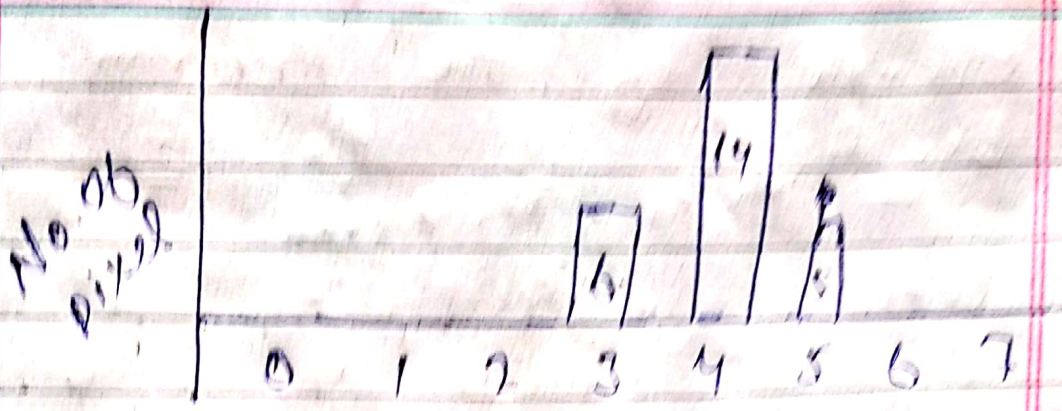
4	4	4	4	4
3	4	5	4	3
3	5	5	5	3
3	4	5	4	3
4	4	4	4	4

max gray value = 5

No. of bits required to represent each intensity = 3 bits

No. of possible gray level = 8 that varies from 0-7

Gray level	0	1	2	3	4	5	6	7
No. of pixel	0	0	0	6	14	5	0	0



G. Level	nk	pk = nk/n	Sk	Sk × 7	Histog.
0	0	0/25 = 0	0	0	0
1	0	0/25 = 0	0	0	0
2	0	0/25 = 0	0	0	0
3	6	6/25 = 0.24	0.24	1.68	2
4	14	14/25 = 0.56	0.8	5.6	6
5	5	5/25 = 0.2	1	7	7
6	0	0/25 = 0	1	7	7
7	0	0/25 = 0	1	7	7

Input Image

4	4	4	4	4
3	4	5	4	5
3	3	5	5	3
3	4	5	4	3
4	4	4	4	4

→

Output Image

6	6	6	6	6
2	6	7	6	7
2	7	7	7	7
2	6	7	6	7
6	6	6	6	6

Ay Ter Histogram Equalization

GL	0	1	2	3	4	5	6	7	→ Input
N.p	0	0	0	6	14	5	0	0	

G.L	0	1	2	3	4	5	6	7	→ output
N.p	0	0	6	0	0	0	14	5	