Quiz-1

$1024 * 1024$

1) $L - 256 = 2^K$

$K = 8.$

considering stop and start bit

$1024 * 1024 * [8+2]$

$$\text{Total time} = \frac{1024 * 1024 * 10}{56000}$$

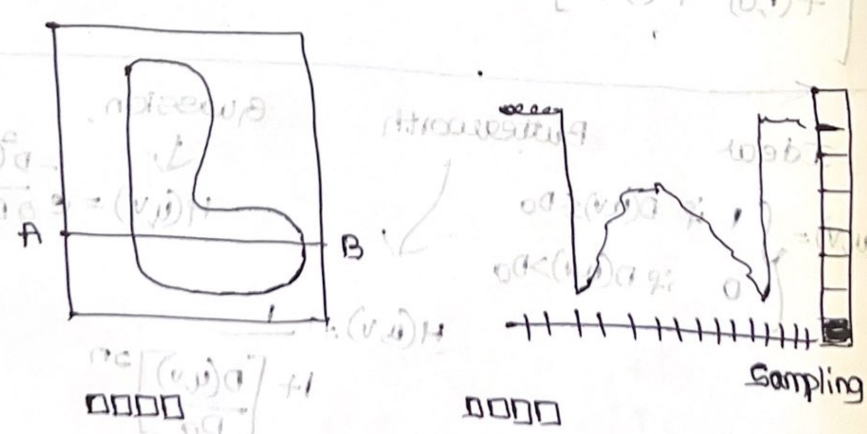
$= 187.25 \text{sec}$ (or) 3.1min

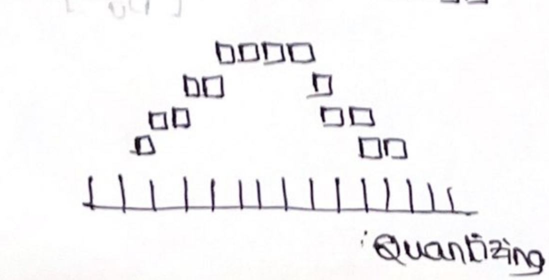
2) Weber ratio :- The relation between the change in intensity to intensity

weber ratio $= \Delta I / I$

3) Sampling :- Digitizing the coordinate value is called sampling

Quantizing : Digitizing the amplitude values





4) Image width = 2400 pixel

Image height = 2400 pixel

Image scanned = 300 dpi

Physical size

$$\text{width} = \frac{\text{I.width}}{\text{I.scanned}} = \frac{2400}{300} = 8 \text{ inches}$$

$$\text{height} = \frac{\text{I.heigth}}{\text{I.scanned}} = \frac{2400}{300} = 8 \text{ inch.}$$

5) Applications

1) space
2) Medical imaging
3) Finger print predicition
4) weather predicition
5) Industry
6) screening of X-rays

6) Digital image Representation

M X N

$$f(x,y) = \begin{bmatrix} f(0,0) & f(0,1) & \cdots & f(0,N-1) \\ f(1,0) & f(1,1) & \cdots & f(1,N-1) \\ \vdots & & & \vdots \\ f(M-1,0) & f(M-1,1) & \cdots & f(M-1,N-1) \end{bmatrix}$$

every value in it represent intensity

$$A = \begin{bmatrix} a_{0,0} & a_{0,1} & \cdots & a_{0,N-1} \\ a_{1,0} & a_{11} & \cdots & a_{1,N-1} \\ \vdots & & & \\ a_{M-1,0} & a_{M-1,1} & \cdots & a_{M-1,N-1} \end{bmatrix}$$

7)

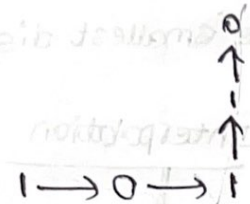
3 1 2 (1)(q) $V = \{0,1\}$

2 2 0 2

1 2 1 1

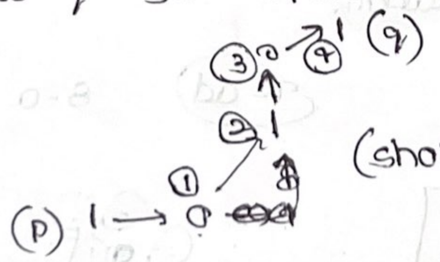
(p)(1) 0 1 2.

(i) 4-Path:- By using 4-adjacency we cannot make a path from p to q using the Values {0,1} given in V.

→ 

(stops here cannot reach q as it is not in 4-adjacency)

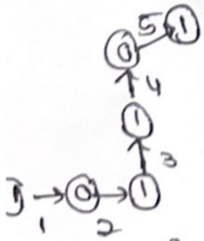
(ii) 8-Path - as through 8-adjacency i.e, including diagonals we have a path from p to q so 8 path exists {0,1}

→ 

(shortest path)

~~respective~~ → Path-length is 4

(iii) m-path :-



- If $N_4(p)$ then we will follow it

(or)

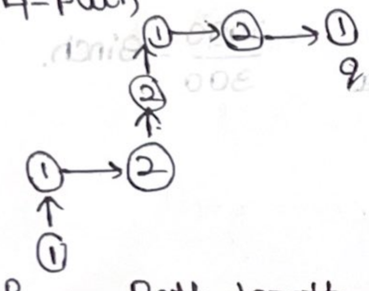
- If $N_D(p)$ and $N_4(p) \cap N_4(q) = \phi$

→ ~~There is 4-path~~ If we are able to draw path using 4-adjacency you can continue when ever we need to go diagnal check for the second condition

7) Given image $V = \{1,2\}$

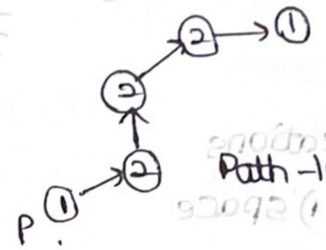
	3	1	2	1 (q)
	2	2	0	2
	1	2	1	1
(p)	1	0	1	2

→ 4-path



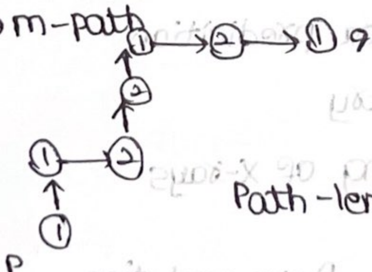
Path-length=6

→ 8-path



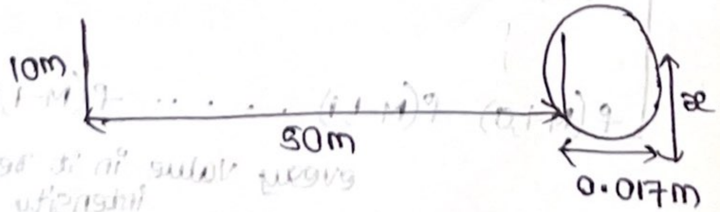
Path-length=4

→ m-path



Path-length=6

8) Focal length = 17mm = 0.017m



$$\frac{10}{50} = \frac{x}{0.017}$$

$$x = \frac{0.017}{5} \cong 0.0034m$$

3.4mm.

Q)

$$\begin{array}{cc|cc} S1 & & S2 & \\ 0 & 0 & 0 & 0 \\ 1 & 0 & 0 & \cancel{1} \\ 1 & 0 & 1 & 1 \\ 1 & q & 0 & 0 \\ \hline 1 & 1 & 0 & 0 \end{array}$$

$V = \{1\}$

(Definitions from Short notes)

i, 4-adjency :- P and q vertex q should be in $N_4(P)$

q is not present in $N_4(P)$

it is not 4-adjency

ii, 8-adjency :- P and q, vertex q should be in $N_8(P)$

As q is present in $N_8(P)$ it is 8-adjacent

iii, m-adjacency :-

a, q is in $N_4(P)$ (or)

b, q is in $N_D(P)$ and the set $N_4(P) \cap N_Q(P)$ has no pixel value from V

~~Q is~~ a - False (not 4-adjency)

b - q is in $N_D(P)$

$N_4(P) - \{0,1\}$

$N_4(Q) - \{0,1\}$

$N_4(P) \cap N_4(Q) = \{0,1\}$

As $1 \in V$

It is not m-adjacency

10) Weber ratio :-

→ Background intensity I

→ Smallest noticeable change in brightness ΔI

→ Weber ratio - $\frac{\Delta I}{I}$

→ Small value of $\frac{\Delta I}{I}$ implies, small % change in intensity is visible, Representing good brightness discrimination.

→ Large value of $\frac{\Delta I}{I}$ implies, large % change ~~in~~ ~~intensi~~ is required for discriminatio representing poor brightness discrimination

→ If Background illumination is high then it has good brightness discrimination

→ If Background illumination is low then it has poor brightness discrimination