Notes

Mechanics

4 bar Mechanism Links which are
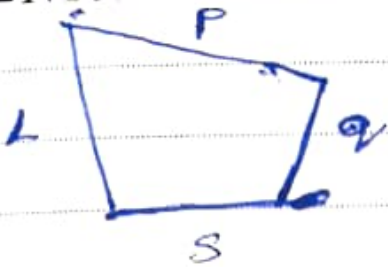- Has 4
joined to make a loop.

Planar 4 bar Mechanism
- If the links have a DOF of 1. Then its is a planar 4 bar Mechanism. It can move only in it's of specified plane.

Grashof Condn

For a four bar mechanism the sum of the shortest and longest link lengths must be lesser than or equal to the sum of remaining 2 link lengths to have a continuous range of motion

$$S + l \leq p + q$$
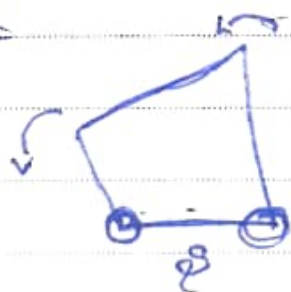
Notes

Inversion of 4 bar Mechanism

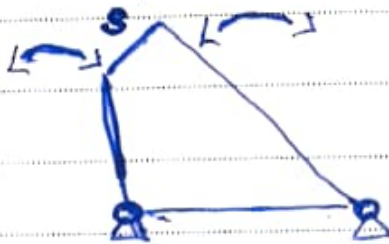By fixing the links in different ways, we can obtain numerous amount of mechanisms.

Types

1) Gureashaf $(S + l < p + q)$

A) Double - Crank

If the smallest link is grounded

___ Notes ___

B) double Rocker

condn : smaller side should be opposite to grounded link

* Both pair of links oscilates

c) Crank rocker
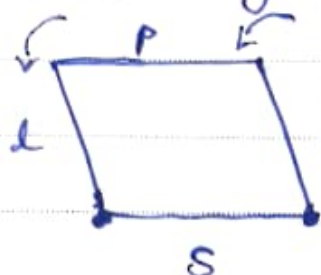
* one other

condn : Link adjacent to shortest link So fixed.

one pair rotates
another pair oscilates

Notes

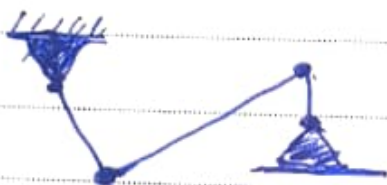2.) Folding $S + \ell = P + q$

A) Parallelogram   (Double Crank)

$\ell = q$
$P = S$

B) Anti - Parallelogram

$\ell = q$
$P = S$

C) Kite Link

$\ell = P$
$q = S$
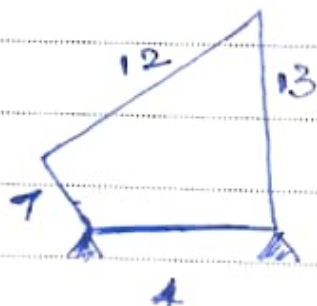
D) Galloway

$\ell = S$
$P = q$

Notes

3) Non - Grashof

Examples of Four - Bar Mechanism

- Table Fan
- Automatic door closer
- Windshield wiper

- Legs movement of four legged animal. Each a pairs act as 4 bar mechanism

- Swings.

b)

$$4 + 13 < 7 + 12$$
$$17 < 19$$

Since it follows Grashof's Law, it is possible to rotate it using a DC motor.