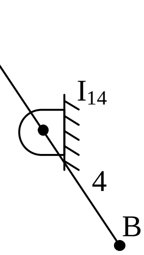
Link 4

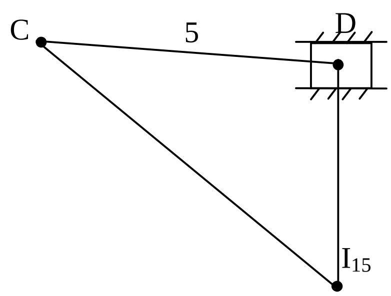


Also $V_b = \omega_4 \times BI_{14}$

$$\omega_4 = \frac{V_b}{BI_{14}} = 6.37 \text{ rad/sec}$$

$V_C = \omega_4 \times CI_{14} = 1.273$ m/s

Link 5



$V_C = \omega_5 \times CI_{15}$

$$\omega_5 = \frac{V_C}{AI_{15}} = 1.72 \text{ rad/sec}$$

$V_d = \omega_5 \times DI_{15} = 0.826$ m/s

Answers
$V_b = 2.675$ m/s
$V_C = 1.273$ m/s
$V_d = 0.826$ m/s
$\omega_{ab} = 2.5$ rad/sec
$\omega_{bc} = 6.37$ rad/sec
$\omega_{cd} = 1.72$ rad/sec

- In the toggle mechanism shown in figure the slider D is constrained to move in a horizontal path the crank OA is rotating in CCW direction at a speed of 180 rpm the dimensions of various links are as follows:

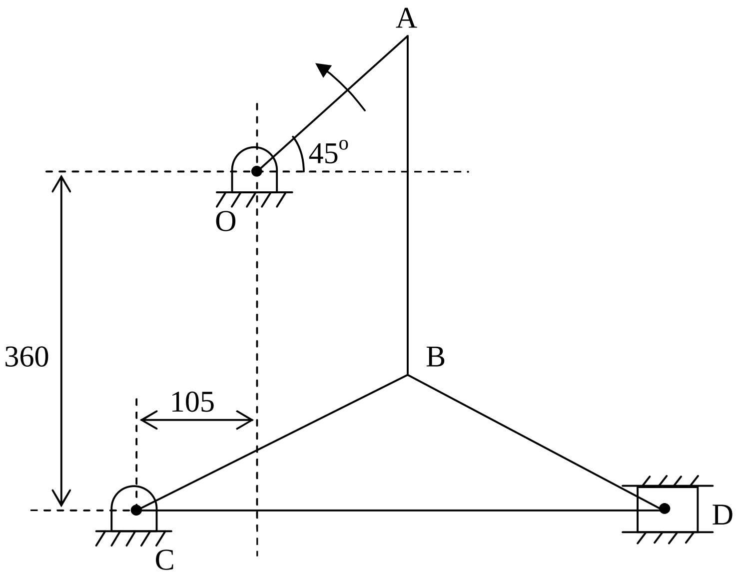
OA = 180 mm　　CB = 240 mm

AB = 360 mm　　BD = 540 mm

Find,

i) Velocity of slider

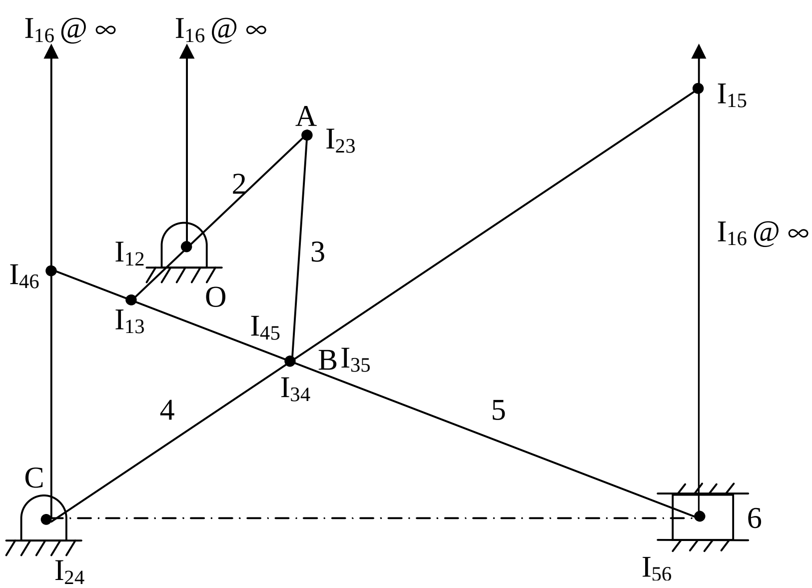
ii) Angular velocity of links AB, CB and BD.



n = 6 links

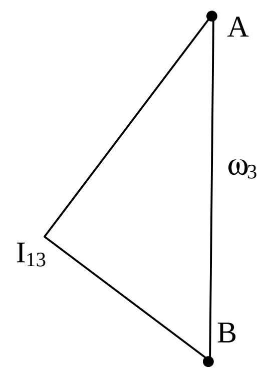
$$N = \frac{n(n-1)}{2} = 15$$

1	2	3	4	5	6	5
12	23	34	45	56		4
13	24	35	46			3
14	25	36				2
15	26					1
16						---
						15



$V_a = \omega_2 \times AI_{12} = 3.4$ m/s

Link 3

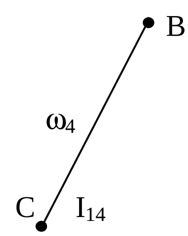


$V_a = \omega_3 \times AI_{13}$

$$\omega_3 = \frac{V_a}{AI_{13}} = 2.44 \text{ rad/sec}$$

$V_b = \omega_3 \times BI_{13}$

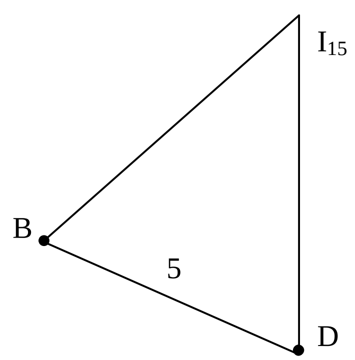
Link 4



$V_b = \omega_4 \times BI_{14}$

$$\omega_4 = \frac{V_b}{AI_{14}} = 11.875 \text{ rad/sec}$$

Link 5



$V_b = \omega_5 \times BI_{15}$

$$\omega_5 = \frac{V_b}{AI_{15}} = 4.37 \text{ rad/sec}$$

$V_d = \omega_5 \times DI_{15} = 2$ m/s

Answers
$V_d = 2$ m/s
$\omega_{ab} = 2.44$ rad/sec
$\omega_{bc} = 11.875$ rad/sec
$\omega_{cd} = 4.37$ rad/sec