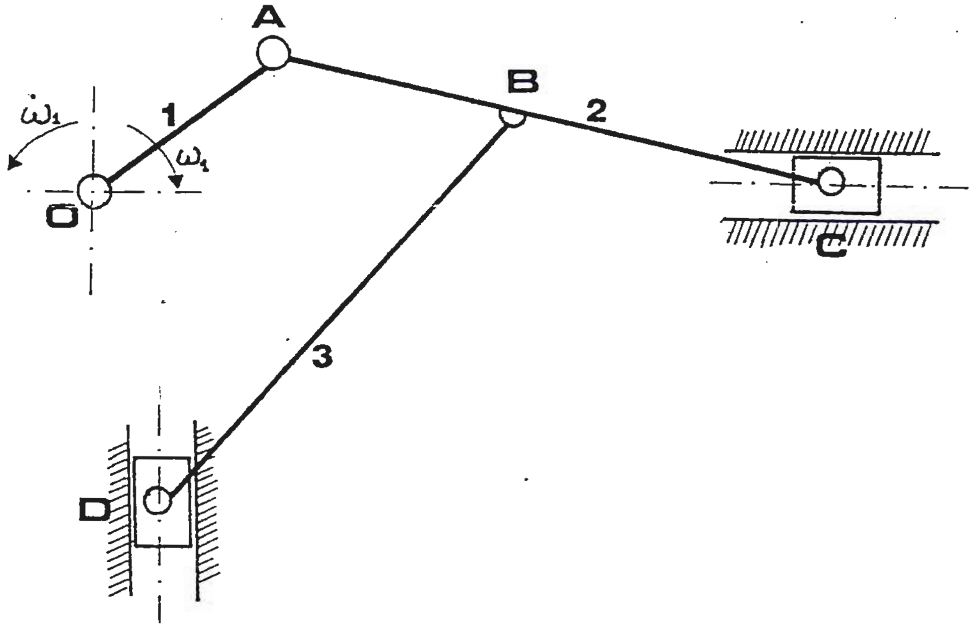


Del sistema articolato in figura (scala 1:10), essendo noti la velocita' angolare della manovella OA $\omega_1 = 1$ rad/s e la sua accelerazione angolare $\dot{\omega}_1 = 2$ rad/s^2, si calcolino la velocita' e l'accelerazione dei due corsoi C e D.

Ricerca delle velocità

$\overline{V}_A = \overline{\omega}_1 \wedge (A-O) = (0.30 \quad m/s)\,\overline{\tau} \qquad (\overline{AO} = 0.30 \ m)$

a questo punto si possono ricavare (FIG. 1) $\overline{V}_C$ e $\overline{V}_{CA}$: $\overline{V}_C = \overline{V}_A + \overline{V}_{CA}$

$V_C = 0.23 \quad m/s \qquad\qquad V_{CA} = 0.24 \quad m/s$

$\omega_2 = \dfrac{V_{CA}}{\overline{CA}} = 0.32 \quad rad/s \qquad\qquad (\overline{CA} = 0.75 \ m)$

cerchiamo la velocità del punto B :

$\overline{V}_{BA} = \overline{\omega}_2 \wedge (B-A) = (0.10 \quad m/s)\,\overline{\tau} \qquad\qquad (\overline{BA} = 0.32 \ m)$

$|\overline{V}_B| = |\overline{V}_A + \overline{V}_{BA}| = 0.28 \quad m/s \qquad\qquad$ (FIG. 2)

ora possiamo trovare graficamente (FIG. 3) $\overline{V}_D$:

$|\overline{V}_D| = |\overline{V}_B + \overline{V}_{DB}| = 0.04 \quad m/s \qquad\qquad V_{DB} = 0.29 \ m/s$

calcoliamo anche (perchè servirà successivamente) ω_3 :

$\omega_3 = \dfrac{V_{DB}}{\overline{DB}} = 0.42 \quad rad/s \qquad\qquad (\overline{DB} = 0.69 \ m)$

Ricerca delle accelerazioni

$a_{AN} = \omega_1^2 \cdot \overline{AO} = 0.30 \quad m/s^2$

$a_{AT} = \dot{\omega}_1 \wedge (A-O) = (0.60 \quad m/s^2)\,\overline{\tau}$

$a_A = \sqrt{a_{AN}^2 + a_{AT}^2} = 0.67 \quad m/s^2$

ricavando prima a_{CAN} e' possibile trovare graficamente (FIG. 4) l'accelerazione del punto c :

$a_{CAN} = \omega_2^2 \cdot \overline{CA} = 0.08 \quad m/s^2$

$\underline{\bar{a}_C} = \bar{a}_A + \bar{a}_{CA} = \underline{\underline{\bar{a}_A}} + \underline{\underline{\bar{a}_{CAN}}} + \underline{\bar{a}_{CAT}} = 0.74 \quad m/s^2$ $\qquad a_{CAT} = 0.32 \quad m/s^2$

$\dot{\omega}_2 = \frac{a_{CAT}}{\overline{CA}} = 0.43 \quad rad/s^2$ $\qquad a_C = 0.75 \quad m/s^2$

da cui :

$a_{BAT} = \dot{\omega}_2 \cdot \overline{BA} = 0.13 \quad m/s^2$

$a_{BAN} = \omega_2^2 \, \overline{BA} = 0.03 \quad m/s^2$

$\underline{\bar{a}_B} = \bar{a}_A + \bar{a}_{BA} = \underline{\underline{\bar{a}_A}} + \underline{\underline{\bar{a}_{BAN}}} + \underline{\bar{a}_{BAT}} = 0.68 \quad m/s^2$ (FIG. 5)

cerchiamo ora la $\bar{a}_D$:

$a_{DBN} = \omega_3^2 \, \overline{DB} = 0.06 \quad m/s^2$

$|\underline{\bar{a}_D}| = |\bar{a}_B + \bar{a}_{DB} = \underline{\underline{\bar{a}_B}} + \underline{\underline{\bar{a}_{DBN}}} + \underline{\bar{a}_{DBT}}| = 0.32 \quad m/s^2$ (FIG. 6)

1cm = 0,05 m/s

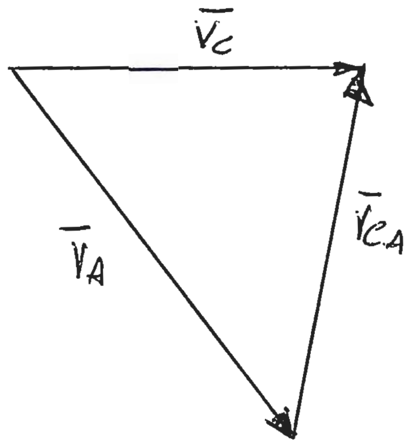
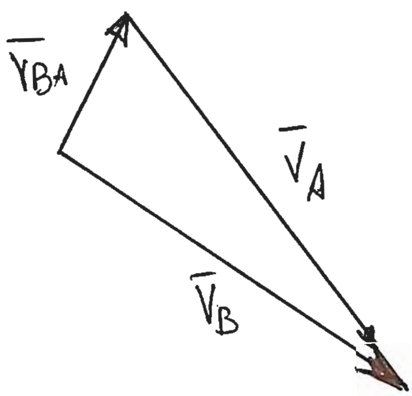
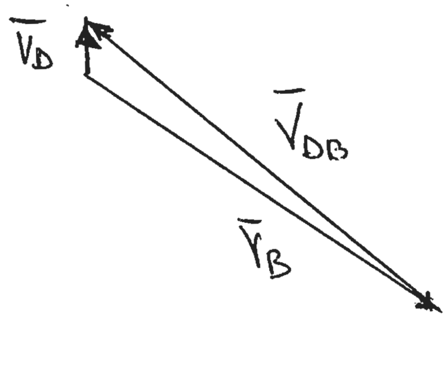


Fig. 1



1cm = 0,05 m/s

Fig. 2



1 cm = 0,05 m/s

Fig. 3

1 cm = 0.10 m/s²

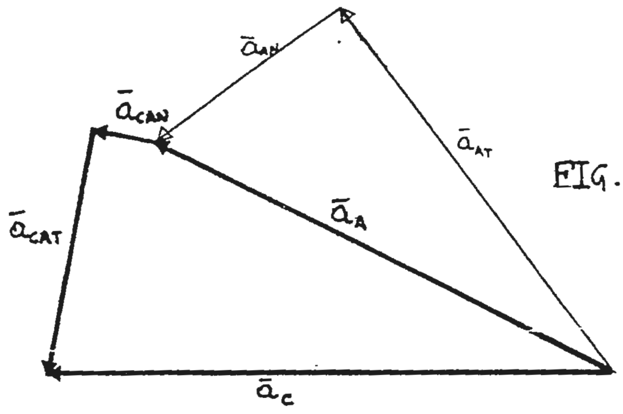
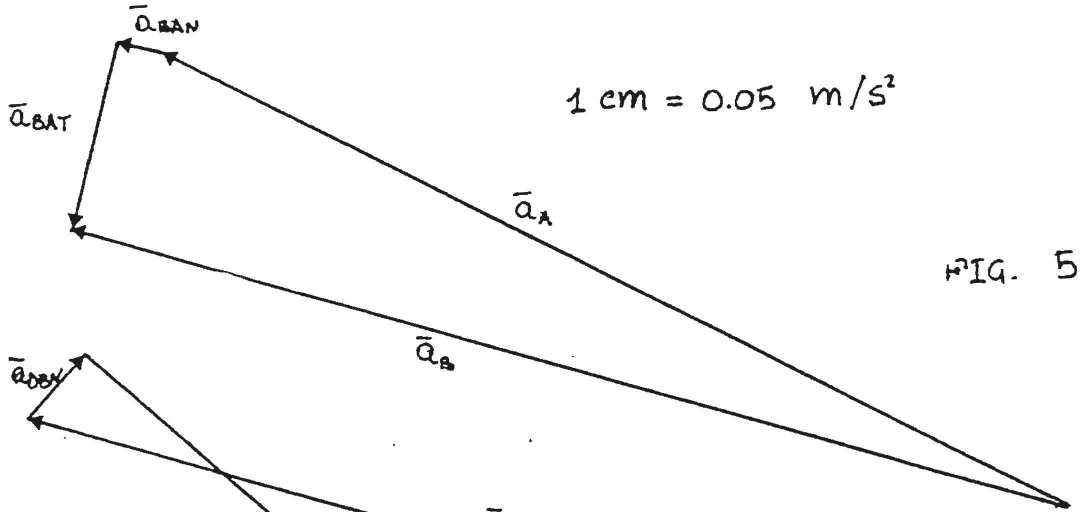
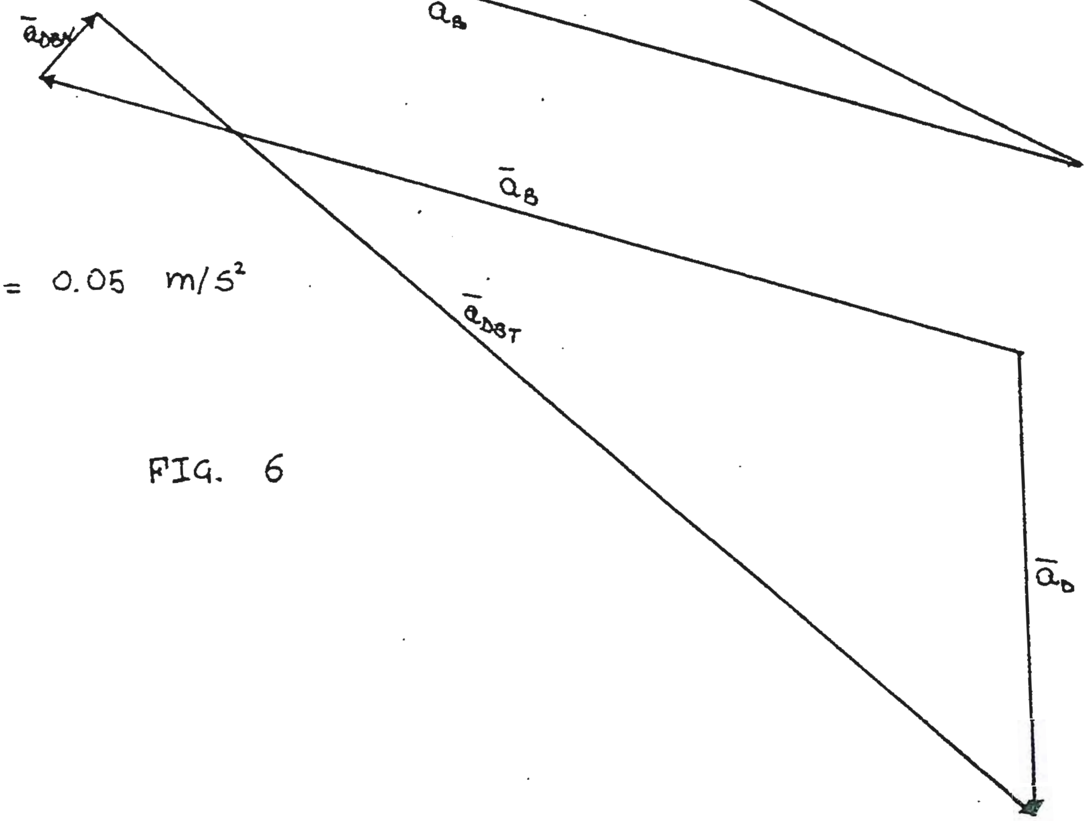


FIG. 4



1 cm = 0.05 m/s²

FIG. 5



1 cm = 0.05 m/s²

FIG. 6