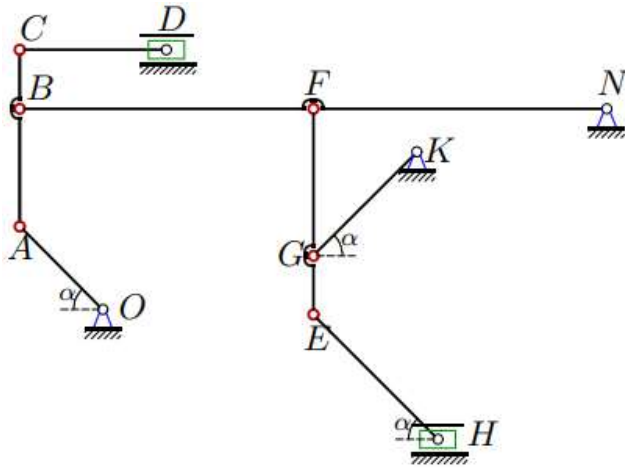
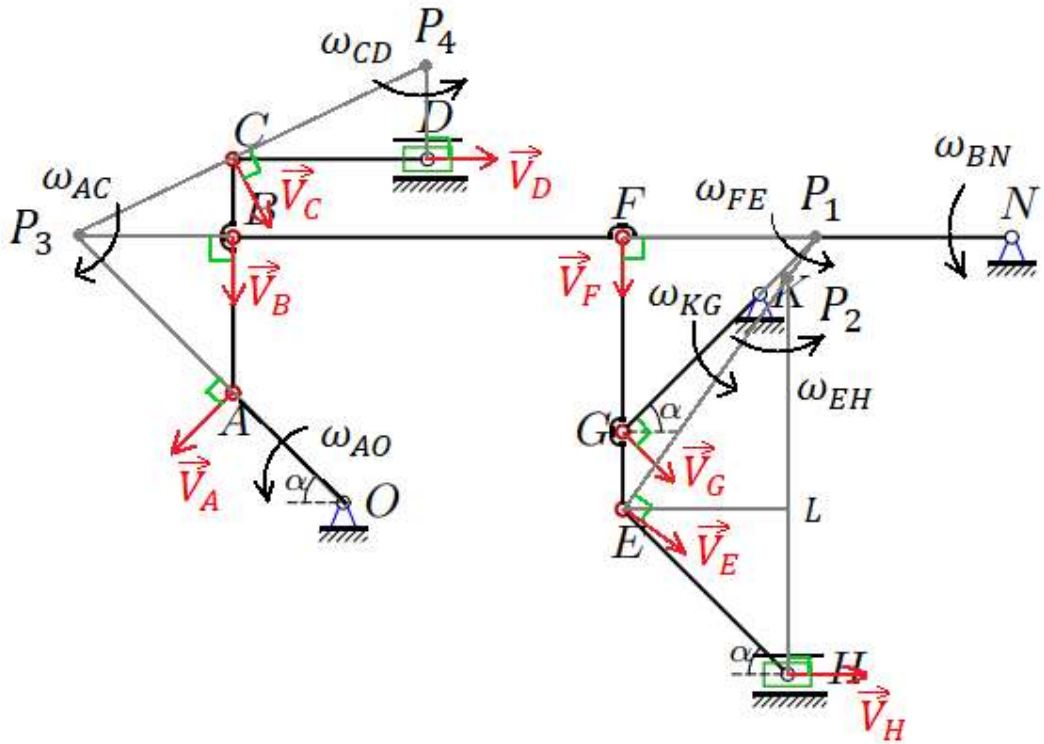


Условие:



$\omega_{KG} = 2 \text{ рад/с}, \alpha = 45^\circ,$   
 $AB = 20, BC = 10,$   
 $BF = 50, NF = 50,$   
 $CD = 25, EH = 30,$   
 $FG = 25, GE = 10,$   
 $OA = 20, KG = 25.$

Решение:



1. Определим расстояние от МЦС до точек.

а) Звено FGE:

Из  $\Delta P_1FG$ :

$$P_1F = \frac{FG}{\text{tg } \alpha} = 25 \quad (1)$$

$$P_1G = \sqrt{P_1F^2 + FG^2} = 35.355 \quad (2)$$

Из  $\Delta P_1EG$ :

$$\text{По теореме Пифагора: } P_1E = \sqrt{P_1F^2 + FE^2} = 43.012 \quad (3)$$

б) Звено EH:

$$\text{Из } \Delta ELH: EL = LH = EH \cdot \cos \alpha \quad (4)$$

Из подобия  $\Delta P_2EL$  и  $\Delta P_1EF$ :

$$P_2L = \frac{FE \cdot EL}{P_1F} = \frac{FE \cdot EH \cdot \cos \alpha}{P_1F} \quad (5)$$

Тогда

$$P_2H = P_2L + LH = \frac{FE \cdot EH \cdot \cos \alpha}{P_1F} + EH \cdot \cos \alpha = 50.912 \quad (6)$$

$$\text{По теореме Пифагора: } P_2E = \sqrt{P_2L^2 + EL^2} = 36.497 \quad (7)$$

в) Звено ABC:

Из  $\Delta P_3AB$ :

$$P_3A = \frac{AB}{\sin \alpha} = 28.284 \quad (8)$$

$$P_3B = \frac{AB}{\cos \alpha} = 20 \quad (9)$$

$$\text{По теореме Пифагора: } P_3C = \sqrt{P_3B^2 + BC^2} = 22.361 \quad (10)$$

г) Звено CD:

Из подобия  $\Delta P_3CB$  и  $\Delta P_4CD$ :

$$P_4D = \frac{BC \cdot CD}{P_3B} = 12.5 \quad (11)$$

$$\text{По теореме Пифагора: } P_4C = \sqrt{P_4D^2 + CD^2} = 27.951 \quad (12)$$

2. Находим все скорости точек и угловые скорости стержней:

а) Звено FGE:

$$V_G = \omega_{KG} \cdot KG = 50 \quad (13)$$

$$V_G = \omega_{EF} \cdot P_1G \rightarrow \omega_{EF} = \frac{V_G}{P_1G} = 1.414 \quad (14)$$

$$V_F = \omega_{FE} \cdot P_1F = 35.355 \quad (15)$$

$$V_E = \omega_{FE} \cdot P_1E = 60.828 \quad (16)$$

б) Звено EH:

$$V_E = \omega_{EH} \cdot P_2E \rightarrow \omega_{EH} = \frac{V_E}{P_2E} = 1.667 \quad (17)$$

$$V_H = \omega_{FE} \cdot P_2H = 84.853 \quad (18)$$

в) Звено BFN:

$$V_F = \omega_{BN} \cdot FN \rightarrow \omega_{BN} = \frac{V_F}{FN} = 0.707 \quad (19)$$

$$V_B = \omega_{BN} \cdot BN = \omega_{BN} \cdot (BF + NF) = 70.7 \quad (20)$$

г) Звено ABC:

$$V_B = \omega_{AC} \cdot P_3A \rightarrow \omega_{AC} = \frac{V_B}{P_3A} = 3.536 \quad (21)$$

$$V_A = \omega_{AC} \cdot P_3A = 100 \quad (22)$$

$$V_C = \omega_{AC} \cdot P_3C = 79.057 \quad (23)$$

д) Звено CD:

$$V_C = \omega_{CD} \cdot P_4C \rightarrow \omega_{CD} = \frac{V_C}{P_4C} = 2.828 \quad (24)$$

$$V_D = \omega_{CD} \cdot P_4D = 35.355 \quad (25)$$

Стержень OA:

$$\omega_{OA} = \frac{V_A}{OA} = 5 \quad (26)$$

ОТВЕТЫ:

$V_A$	$V_B$	$V_C$	$V_D$	$V_E$	$V_F$	$V_G$	$V_H$
100	3.536	70.7	35.355	60.828	35.355	50	84.853

$\omega_{OA}$	$\omega_{AC}$	$\omega_{CD}$	$\omega_{BN}$	$\omega_{EF}$	$\omega_{KG}$	$\omega_{EH}$
5	3.536	2.828	0.707	1.667	2	1.667