

Скорости точек многосвязного механизма

Плоский многосвязный механизм с одной степенью свободы приводится в движение кривошипом, который вращается против часовой стрелки с постоянной угловой скоростью. Найти скорости точек механизма (в см/с) и угловые скорости его звеньев (в рад/с). Размеры даны в см.

Кирсанов М.Н. Решебник. Теоретическая механика с. 158.

Вариант 1

$\omega_{OA} = 1 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 20, BC = 10,$
 $BF = 20, NF = 80,$
 $CD = 15, EH = 30,$
 $FG = 10, GE = 45,$
 $OA = 20, KG = 25.$

Вариант 2

$\omega_{OA} = 2 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 10, BC = 30,$
 $NB = 20, NF = 15,$
 $CD = 15, EH = 30,$
 $FE = 15, FG = 20,$
 $OA = 20, KG = 25.$

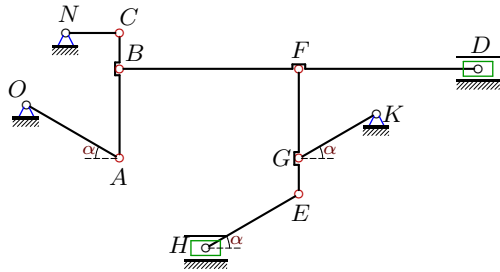
Вариант 3

$\omega_{OA} = 3 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 25, BC = 10,$
 $BF = 80, FD = 20,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 30, KG = 25.$

Вариант 4

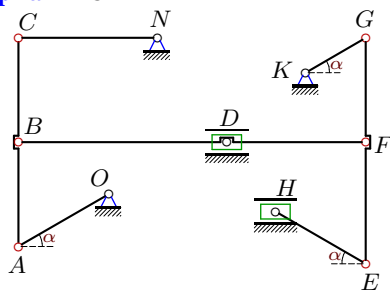
$\omega_{OA} = 4 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 30, BC = 30,$
 $DB = 20, DF = 30,$
 $NC = 15, EH = 30,$
 $FE = 15, FG = 20,$
 $OA = 30, KG = 25.$

Вариант 5



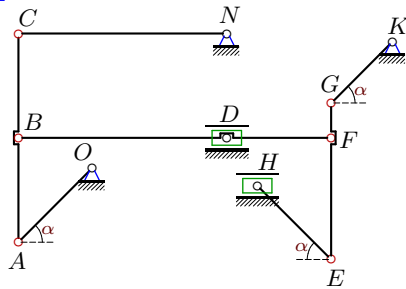
$\omega_{NC} = 5 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 25, BC = 10,$
 $BF = 50, FD = 50,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 30, KG = 25.$

Вариант 6



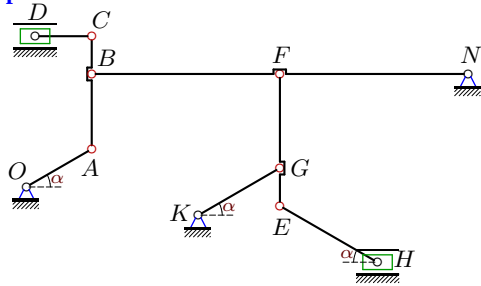
$\omega_{OA} = 6 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 30, BC = 30,$
 $DB = 60, DF = 40,$
 $NC = 40, EH = 30,$
 $FE = 35, FG = 30,$
 $OA = 30, KG = 20.$

Вариант 7



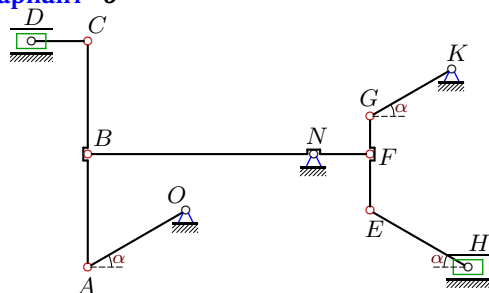
$\omega_{OA} = 7 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 30, BC = 30,$
 $DB = 60, DF = 30,$
 $NC = 60, EH = 30,$
 $FE = 35, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 8



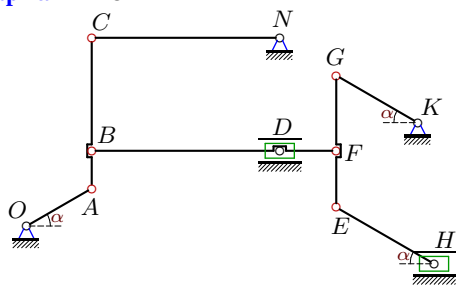
$\omega_{NB} = 8 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 20, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 15, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 20, KG = 25.$

Вариант 9



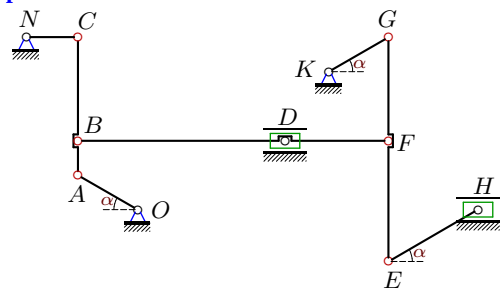
$\omega_{OA} = 9 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 30, BC = 30,$
 $NB = 60, NF = 15,$
 $CD = 15, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 10



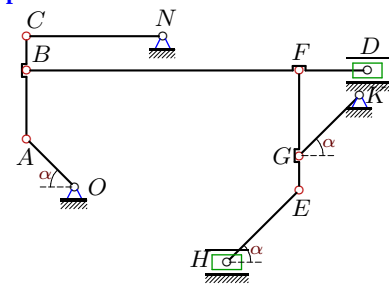
$\omega_{OA} = 10 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 10, BC = 30,$
 $DB = 50, DF = 15,$
 $NC = 50, EH = 30,$
 $FE = 15, FG = 20,$
 $OA = 20, KG = 25.$

Вариант 11



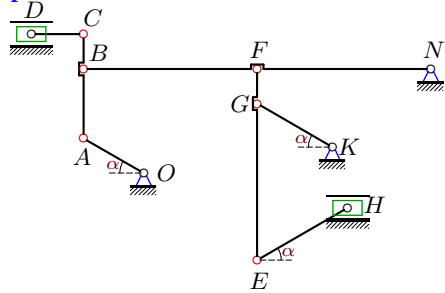
$\omega_{NC} = 11 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 10, BC = 30,$
 $DB = 60, DF = 30,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 30,$
 $OA = 20, KG = 20.$

Вариант 12



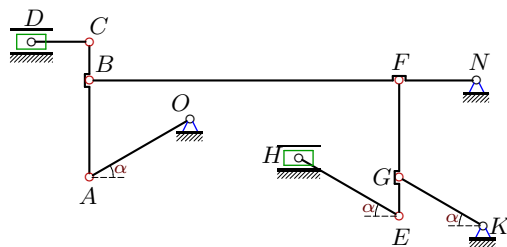
$\omega_{OA} = 12 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 20, BC = 10,$
 $BF = 80, FD = 20,$
 $NC = 40, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 20, KG = 25.$

Вариант 13



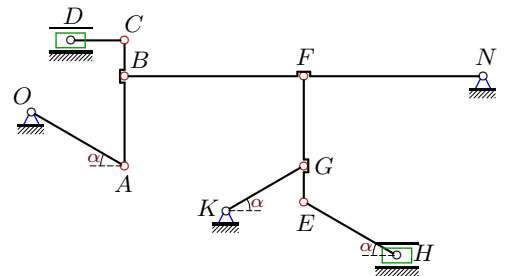
$\omega_{KG} = 13$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 20, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 15, EH = 30,$
 $FG = 10, GE = 45,$
 $OA = 20, KG = 25.$

Вариант 14



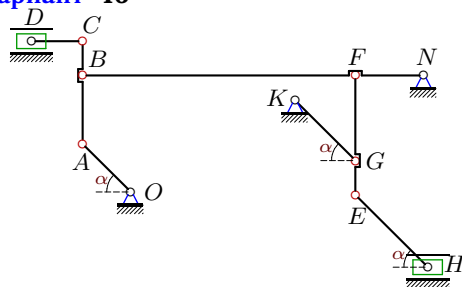
$\omega_{NB} = 14$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 15, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 30, KG = 25.$

Вариант 15



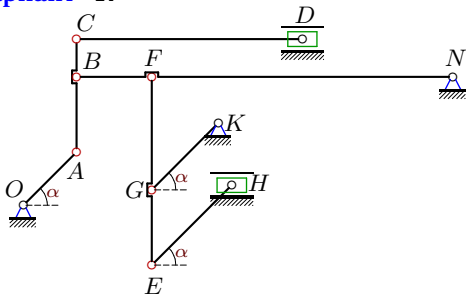
$\omega_{KG} = 15$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 15, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 30, KG = 25.$

Вариант 16



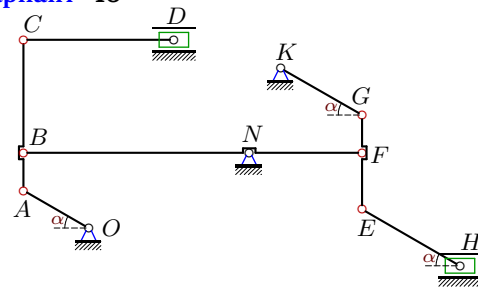
$\omega_{OA} = 16$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 20, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 15, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 20, KG = 25.$

Вариант 17



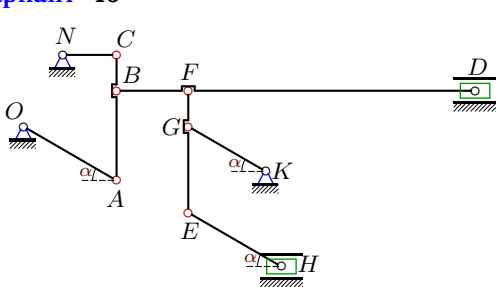
$\omega_{OA} = 17$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 20, BC = 10,$
 $BF = 20, NF = 80,$
 $CD = 60, EH = 30,$
 $FG = 30, GE = 20,$
 $OA = 20, KG = 25.$

Вариант 18



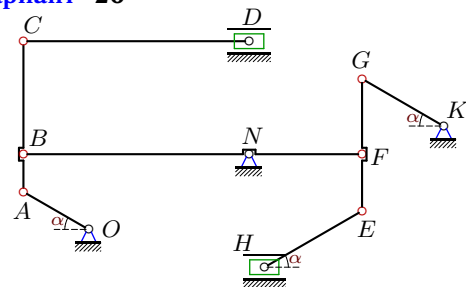
$\omega_{OA} = 18$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 10, BC = 30,$
 $NB = 60, NF = 30,$
 $CD = 40, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 20, KG = 25.$

Вариант 19



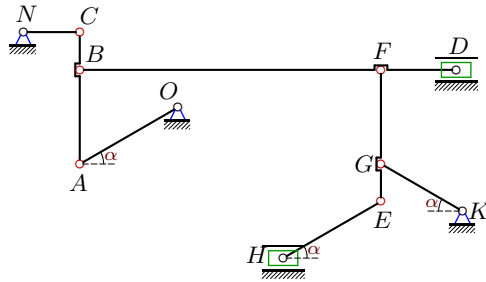
$\omega_{NC} = 19$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 20, FD = 80,$
 $NC = 15, EH = 30,$
 $FE = 34, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 20



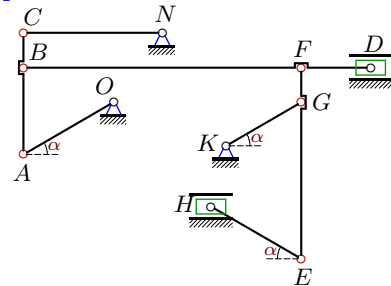
$\omega_{BF} = 20$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 10, BC = 30,$
 $NB = 60, NF = 30,$
 $CD = 60, EH = 30,$
 $FE = 15, FG = 20,$
 $OA = 20, KG = 25.$

Вариант 21



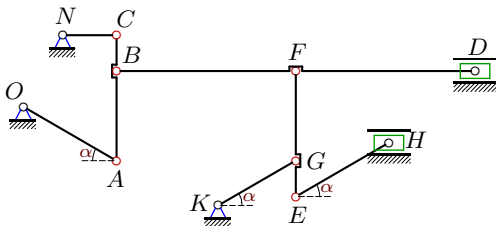
$\omega_{NC} = 21$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 80, FD = 20,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 30, KG = 25.$

Вариант 22



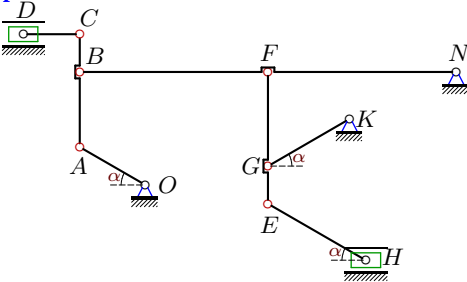
$\omega_{NC} = 22$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 80, FD = 20,$
 $NC = 40, EH = 30,$
 $FE = 55, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 23



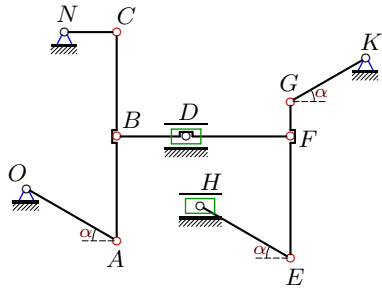
$\omega_{NC} = 23$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 50, FD = 50,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 30, KG = 25.$

Вариант 24



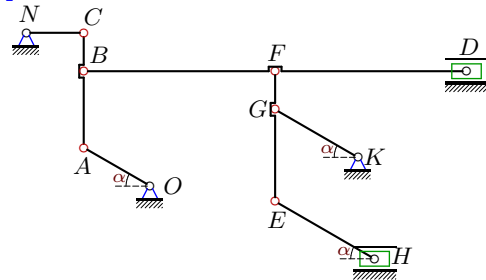
$\omega_{NB} = 24$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 20, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 15, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 20, KG = 25.$

Вариант 25



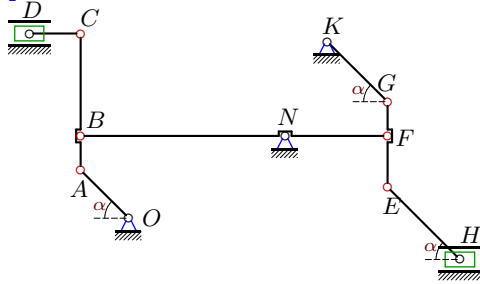
$\omega_{NC} = 25 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 30, BC = 30,$
 $DB = 20, DF = 30,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 26



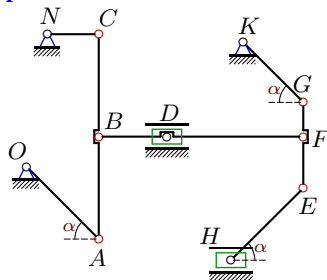
$\omega_{OA} = 26 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 20, BC = 10,$
 $BF = 50, FD = 50,$
 $NC = 15, EH = 30,$
 $FE = 34, FG = 10,$
 $OA = 20, KG = 25.$

Вариант 27



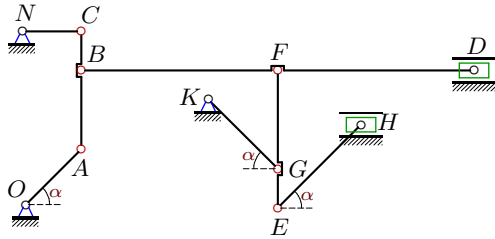
$\omega_{OA} = 27 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 10, BC = 30,$
 $NB = 60, NF = 30,$
 $CD = 15, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 20, KG = 25.$

Вариант 28



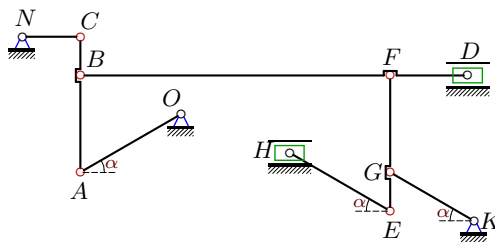
$\omega_{OA} = 28 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 30, BC = 30,$
 $DB = 20, DF = 40,$
 $NC = 15, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 29



$\omega_{OA} = 29$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 20$, $BC = 10$,
 $BF = 50$, $FD = 50$,
 $NC = 15$, $EH = 30$,
 $FE = 35$, $FG = 25$,
 $OA = 20$, $KG = 25$.

Вариант 30



$\omega_{NC} = 30$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25$, $BC = 10$,
 $BF = 80$, $FD = 20$,
 $NC = 15$, $EH = 30$,
 $FE = 35$, $FG = 25$,
 $OA = 30$, $KG = 25$.

Ответы

	v_A	v_B	v_C	v_D	v_E	v_F	v_G	v_H
1	20.000	17.321	18.028	5.000	46.130	13.856	16.000	52.000
2	40.000	34.641	69.282	60.000	28.312	25.981	30.000	26.250
3	90.000	78.996	77.942	12.857	17.280	20.207	18.000	16.457
4	120.000	108.167	103.923	30.000	196.723	158.745	180.000	30.000
5	86.603	76.014	75.000	12.372	51.473	39.488	43.301	13.609
6	180.000	162.250	155.885	45.000	197.120	113.248	120.000	107.500
7	210.000	166.020	148.492	74.246	598.592	105.000	105.000	519.723
8	923.760	800.000	832.666	230.940	514.328	400.000	461.880	554.256
9	270.000	233.827	270.000	135.000	77.331	58.457	67.500	16.875
10	200.000	188.746	173.205	75.000	120.526	91.241	60.000	78.750
11	190.526	179.805	165.000	71.447	129.047	109.137	95.263	51.601
12	240.000	178.885	169.706	56.569	77.925	65.970	48.000	36.204
13	650.000	562.917	585.902	162.500	937.021	281.458	325.000	1056.250
14	1616.581	1400.000	1436.848	323.316	360.030	280.000	323.316	64.663
15	750.000	649.519	666.615	150.000	417.582	324.760	375.000	450.000
16	320.000	226.274	252.982	113.137	77.859	45.255	64.000	18.102
17	340.000	240.416	268.794	120.208	373.828	192.333	272.000	128.222
18	360.000	311.769	623.538	540.000	206.216	155.885	180.000	225.000
19	329.090	288.852	285.000	47.013	405.005	232.796	263.272	203.095
20	1385.641	1200.000	2400.000	2078.461	653.835	600.000	692.820	86.603
21	363.731	319.257	315.000	51.962	95.451	81.664	72.746	108.080
22	1016.136	891.892	880.000	145.162	199.697	228.141	203.227	7.258
23	398.372	349.662	345.000	56.910	236.777	181.645	199.186	62.601
24	2771.281	2400.000	2497.999	692.820	1542.984	1200.000	1385.641	1662.769
25	433.013	390.312	375.000	108.253	859.233	572.822	649.519	324.760
26	520.000	458.597	450.333	86.667	324.740	241.270	260.000	104.000
27	540.000	381.838	1207.477	1145.513	344.184	190.919	270.000	477.297
28	840.000	664.078	593.970	296.985	2789.919	1224.500	1680.000	1336.432
29	580.000	432.306	410.122	136.707	398.567	246.453	290.000	546.829
30	519.615	456.081	450.000	74.231	136.358	116.663	103.923	50.477