

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

$\omega_{KG} = 1 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 10, BC = 30,$
 $NB = 60, NF = 15,$
 $CD = 15, EH = 30,$
 $FE = 35, FG = 10,$
 $OA = 20, KG = 25.$

Вариант 2

$\omega_{OA} = 2 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 25, BC = 10,$
 $BF = 50, FD = 50,$
 $NC = 25, EH = 30,$
 $FE = 55, FG = 10,$
 $OA = 30, KG = 25.$

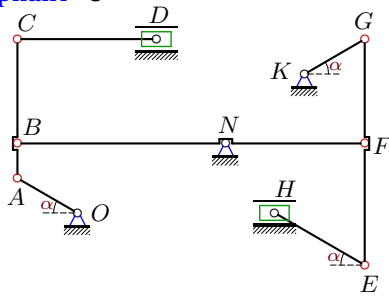
Вариант 3

$\omega_{NC} = 3 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 20, BC = 10,$
 $BF = 50, FD = 50,$
 $NC = 15, EH = 30,$
 $FE = 55, FG = 10,$
 $OA = 20, KG = 25.$

Вариант 4

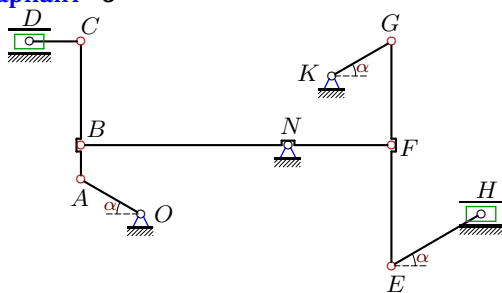
$\omega_{NC} = 4 \text{ рад/с,}$
 $\alpha = 30^\circ,$
 $AB = 25, BC = 10,$
 $BF = 50, FD = 50,$
 $NC = 25, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 30, KG = 25.$

Вариант 5



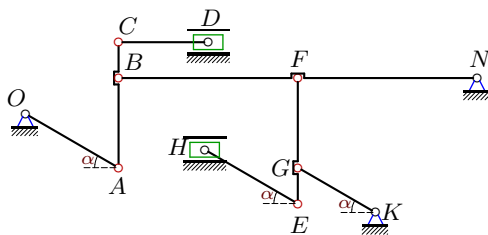
$\omega_{OA} = 5$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 10, BC = 30,$
 $NB = 60, NF = 40,$
 $CD = 40, EH = 30,$
 $FE = 35, FG = 30,$
 $OA = 20, KG = 20.$

Вариант 6



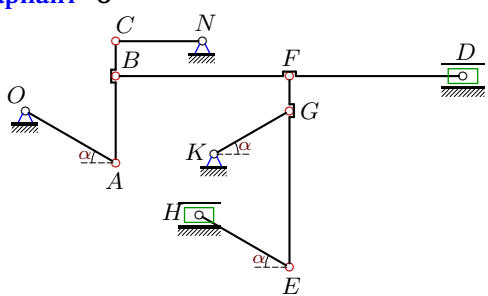
$\omega_{BF} = 6$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 10, BC = 30,$
 $NB = 60, NF = 30,$
 $CD = 15, EH = 30,$
 $FE = 35, FG = 30,$
 $OA = 20, KG = 20.$

Вариант 7



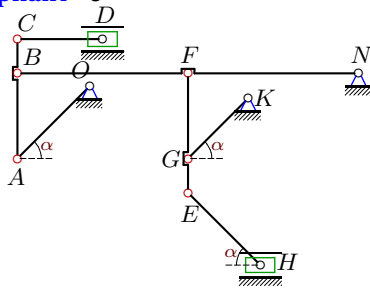
$\omega_{OA} = 7$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 25, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 30, KG = 25.$

Вариант 8



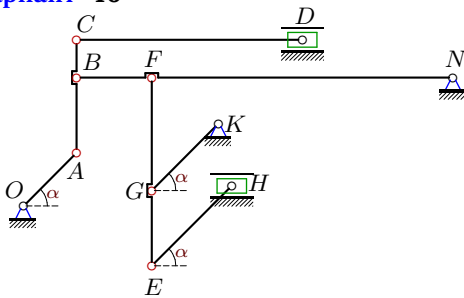
$\omega_{NC} = 8$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 50, FD = 50,$
 $NC = 25, EH = 30,$
 $FE = 55, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 9



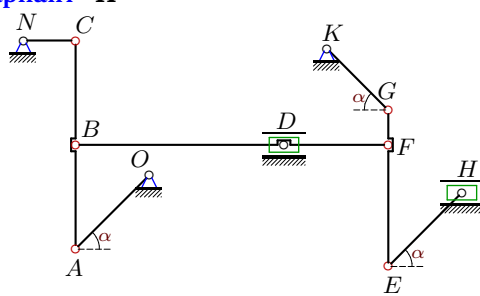
$\omega_{OA} = 9 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 25, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 25, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 30, KG = 25.$

Вариант 10



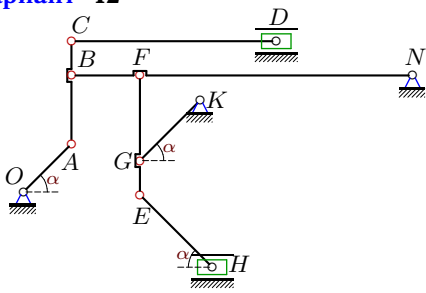
$\omega_{OA} = 10 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 20, BC = 10,$
 $BF = 20, NF = 80,$
 $CD = 60, EH = 30,$
 $FG = 30, GE = 20,$
 $OA = 20, KG = 25.$

Вариант 11



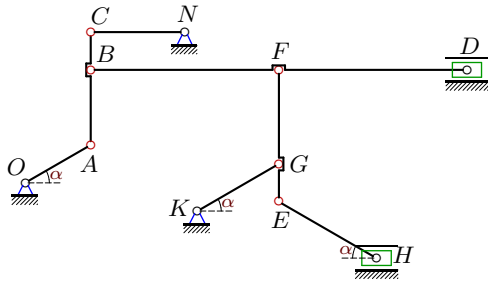
$\omega_{NC} = 11 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 30, BC = 30,$
 $DB = 60, DF = 30,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 12



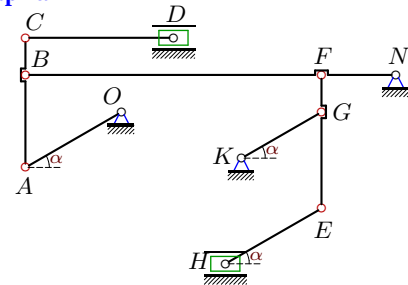
$\omega_{KG} = 12 \text{ рад/с,}$
 $\alpha = 45^\circ,$
 $AB = 20, BC = 10,$
 $BF = 20, NF = 80,$
 $CD = 60, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 20, KG = 25.$

Вариант 13



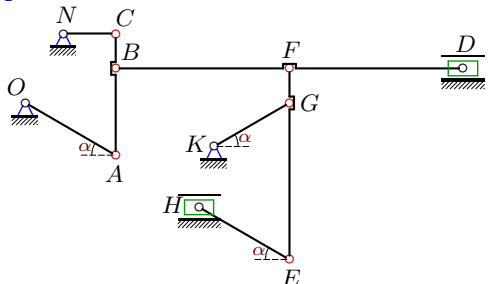
$\omega_{NC} = 13$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 20, BC = 10,$
 $BF = 50, FD = 50,$
 $NC = 25, EH = 30,$
 $FE = 35, FG = 25,$
 $OA = 20, KG = 25.$

Вариант 14



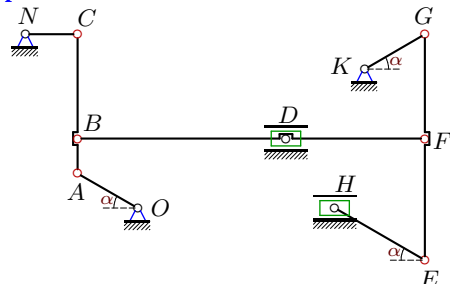
$\omega_{OA} = 14$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 40, EH = 30,$
 $FG = 10, GE = 26,$
 $OA = 30, KG = 25.$

Вариант 15



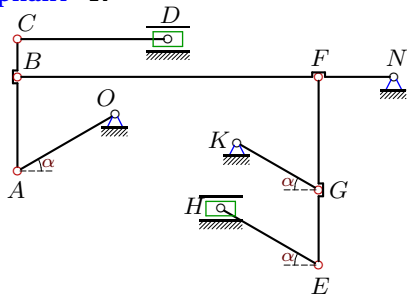
$\omega_{OA} = 15$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 50, FD = 50,$
 $NC = 15, EH = 30,$
 $FE = 55, FG = 10,$
 $OA = 30, KG = 25.$

Вариант 16



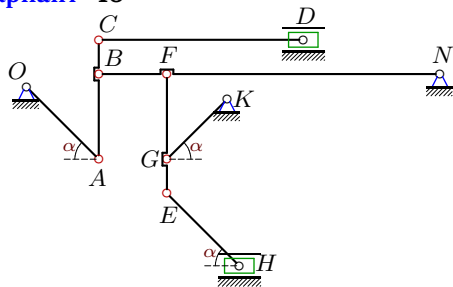
$\omega_{NC} = 16$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 10, BC = 30,$
 $DB = 60, DF = 40,$
 $NC = 15, EH = 30,$
 $FE = 35, FG = 30,$
 $OA = 20, KG = 20.$

Вариант 17



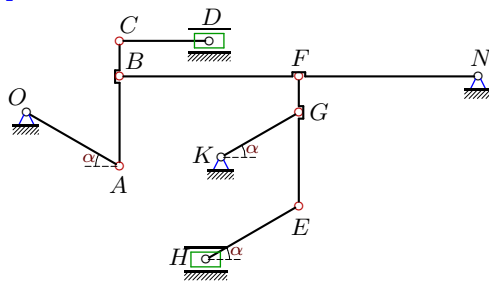
$\omega_{KG} = 17$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 40, EH = 30,$
 $FG = 30, GE = 20,$
 $OA = 30, KG = 25.$

Вариант 18



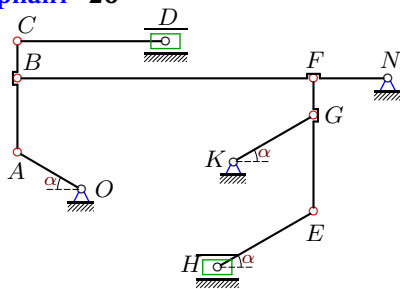
$\omega_{OA} = 18$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 25, BC = 10,$
 $BF = 20, NF = 80,$
 $CD = 60, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 30, KG = 25.$

Вариант 19



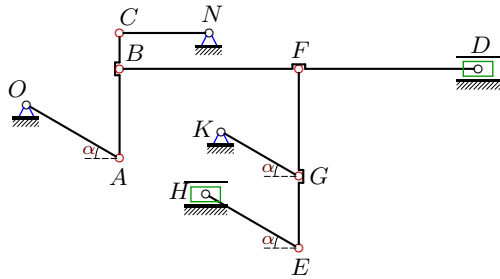
$\omega_{OA} = 19$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 25, EH = 30,$
 $FG = 10, GE = 26,$
 $OA = 30, KG = 25.$

Вариант 20



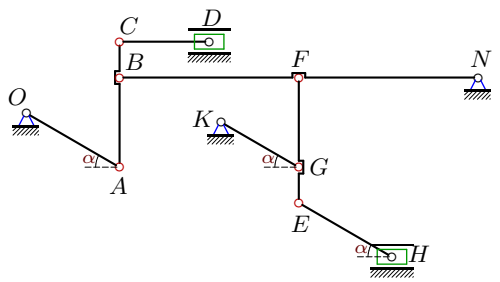
$\omega_{KG} = 20$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 20, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 40, EH = 30,$
 $FG = 10, GE = 26,$
 $OA = 20, KG = 25.$

Вариант 21



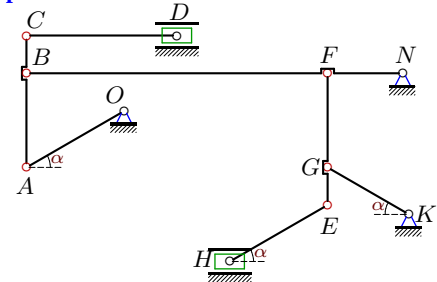
$\omega_{OA} = 21$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 50, FD = 50,$
 $NC = 25, EH = 30,$
 $FE = 50, FG = 30,$
 $OA = 30, KG = 25.$

Вариант 22



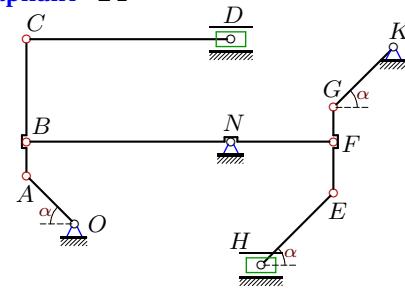
$\omega_{NB} = 22$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 50, NF = 50,$
 $CD = 25, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 30, KG = 25.$

Вариант 23



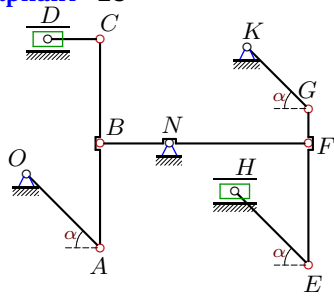
$\omega_{OA} = 23$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25, BC = 10,$
 $BF = 80, NF = 20,$
 $CD = 40, EH = 30,$
 $FG = 25, GE = 10,$
 $OA = 30, KG = 25.$

Вариант 24



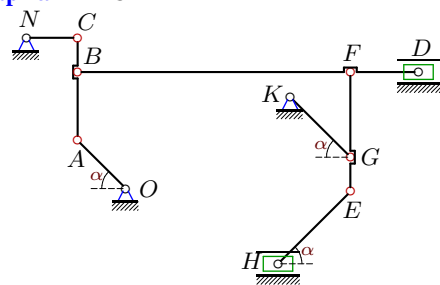
$\omega_{OA} = 24$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 10, BC = 30,$
 $NB = 60, NF = 30,$
 $CD = 60, EH = 30,$
 $FE = 15, FG = 10,$
 $OA = 20, KG = 25.$

Вариант 25



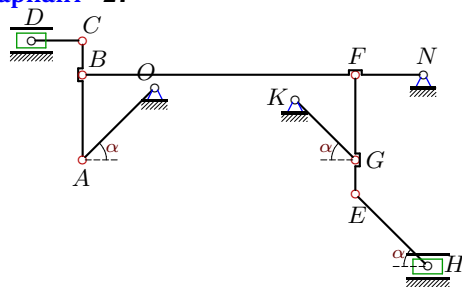
$\omega_{OA} = 25$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 30$, $BC = 30$,
 $NB = 20$, $NF = 40$,
 $CD = 15$, $EH = 30$,
 $FE = 35$, $FG = 10$,
 $OA = 30$, $KG = 25$.

Вариант 26



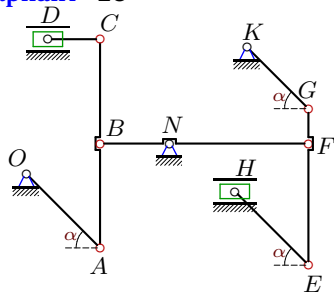
$\omega_{NC} = 26$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 20$, $BC = 10$,
 $BF = 80$, $FD = 20$,
 $NC = 15$, $EH = 30$,
 $FE = 35$, $FG = 25$,
 $OA = 20$, $KG = 25$.

Вариант 27



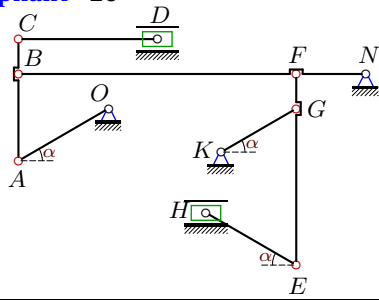
$\omega_{OA} = 27$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 25$, $BC = 10$,
 $BF = 80$, $NF = 20$,
 $CD = 15$, $EH = 30$,
 $FG = 25$, $GE = 10$,
 $OA = 30$, $KG = 25$.

Вариант 28



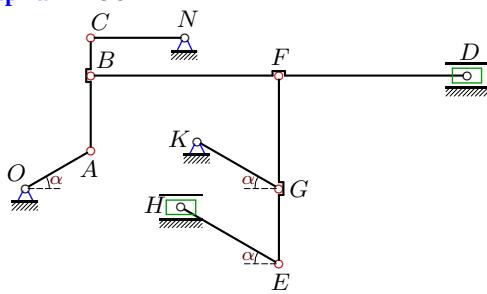
$\omega_{KG} = 28$ рад/с,
 $\alpha = 45^\circ$,
 $AB = 30$, $BC = 30$,
 $NB = 20$, $NF = 40$,
 $CD = 15$, $EH = 30$,
 $FE = 35$, $FG = 10$,
 $OA = 30$, $KG = 25$.

Вариант 29



$\omega_{OA} = 29$ рад/с,
 $\alpha = 30^\circ$,
 $AB = 25$, $BC = 10$,
 $BF = 80$, $NF = 20$,
 $CD = 40$, $EH = 30$,
 $FG = 10$, $GE = 45$,
 $OA = 30$, $KG = 25$.

Вариант 30



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

Ответы

	v_A	v_B	v_C	v_D	v_E	v_F	v_G	v_H
1	100.000	86.603	173.205	150.000	48.814	21.651	25.000	56.250
2	60.000	52.664	51.962	8.571	123.828	27.358	30.000	136.071
3	51.962	45.826	45.000	8.660	39.509	24.109	25.981	45.466
4	115.470	101.351	100.000	16.496	68.631	52.651	57.735	75.880
5	100.000	86.603	173.205	150.000	69.611	57.735	66.667	5.556
6	415.692	360.000	720.000	623.538	217.025	180.000	207.846	225.167
7	210.000	181.865	186.652	42.000	116.923	90.933	105.000	21.000
8	230.940	202.703	200.000	32.991	476.613	105.302	115.470	523.739
9	270.000	190.919	205.626	76.368	164.235	95.459	135.000	229.103
10	200.000	141.421	158.114	70.711	219.899	113.137	160.000	75.425
11	233.345	184.476	165.000	82.500	116.673	116.673	116.673	165.000
12	375.000	265.165	296.464	132.583	364.966	212.132	300.000	509.117
13	375.278	330.964	325.000	62.546	194.196	174.121	187.639	200.148
14	420.000	363.731	373.304	84.000	167.790	72.746	84.000	109.200
15	450.000	394.978	389.711	64.286	928.707	205.186	225.000	1020.536
16	277.128	261.534	240.000	103.923	198.448	190.788	184.752	209.771
17	2125.000	1840.304	1888.741	425.000	510.786	368.061	425.000	141.667
18	540.000	381.838	411.252	152.735	525.551	305.470	432.000	733.128
19	570.000	493.634	506.627	114.000	569.287	246.817	285.000	370.500
20	2500.000	2165.064	2253.470	625.000	998.749	433.013	500.000	650.000
21	630.000	552.969	545.596	90.000	339.743	287.261	315.000	45.000
22	2540.341	2200.000	2257.905	508.068	1414.402	1100.000	1270.171	254.034
23	690.000	597.558	613.285	138.000	153.670	119.512	138.000	165.600
24	480.000	339.411	1073.313	1018.234	305.941	169.706	240.000	424.264
25	750.000	530.330	750.000	530.330	3860.861	1060.660	1500.000	4772.971
26	551.543	411.096	390.000	130.000	96.726	151.605	110.309	135.200
27	810.000	572.756	616.878	229.103	197.082	114.551	162.000	45.821
28	350.000	247.487	350.000	247.487	1801.735	494.975	700.000	2227.386
29	870.000	753.442	773.273	174.000	501.666	150.688	174.000	565.500
30	600.000	529.150	519.615	100.000	409.607	278.388	300.000	166.667