

Передаточные функции типовых элементарных звеньев

Задание

1. Заполните таблицу указанной ниже формы дифференциальными уравнениями и передаточными функциями типовых звеньев.

	П	А	ИИ	РИ	ИД	РД	Звено 2-го порядка
ДУ							
$W(p)$							

2. Определите тип звена и его параметры по заданному дифференциальному уравнению.

№	Дифференциальное уравнение
1	$25 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 10 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 5x_{\text{ВЫХ}}(t) = 50x_{\text{ВХ}}(t)$
2	$5 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 10x_{\text{ВЫХ}}(t) = 0,5 \frac{dx_{\text{ВХ}}(t)}{dt}$
3	$100 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 10x_{\text{ВЫХ}}(t) = 5 \int_0^t x_{\text{ВХ}}(t) dt$
4	$3 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 15 \frac{dx_{\text{ВЫХ}}(t)}{dt} = 300x_{\text{ВХ}}(t)$
5	$250 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + \frac{dx_{\text{ВЫХ}}(t)}{dt} + 5x_{\text{ВЫХ}}(t) = 500x_{\text{ВХ}}(t)$
6	$2 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 4x_{\text{ВЫХ}}(t) = 6x_{\text{ВХ}}(t)$
7	$50 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 10x_{\text{ВЫХ}}(t) = 0,5 \frac{dx_{\text{ВХ}}(t)}{dt}$
8	$500 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 10x_{\text{ВЫХ}}(t) = 5 \int_0^t x_{\text{ВХ}}(t) dt$
9	$300 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 6x_{\text{ВЫХ}}(t) = 24x_{\text{ВХ}}(t)$
10	$5 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 25x_{\text{ВЫХ}}(t) = 250x_{\text{ВХ}}(t)$
11	$3 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 15x_{\text{ВЫХ}}(t) = 45x_{\text{ВХ}}(t)$

12	$2 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 10 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 50 x_{\text{ВЫХ}}(t) = 1000 x_{\text{ВХ}}(t)$
13	$4 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 10 \frac{dx_{\text{ВЫХ}}(t)}{dt} = 48 x_{\text{ВХ}}(t)$
14	$4 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 10 x_{\text{ВЫХ}}(t) = 0,8 \frac{dx_{\text{ВХ}}(t)}{dt}$
15	$200 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 100 x_{\text{ВЫХ}}(t) = 5 \int_0^t x_{\text{ВХ}}(t) dt$
16	$4 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 20 x_{\text{ВЫХ}}(t) = 600 x_{\text{ВХ}}(t)$
17	$2,5 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 100 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 5 x_{\text{ВЫХ}}(t) = 50 x_{\text{ВХ}}(t)$
18	$7 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 49 x_{\text{ВЫХ}}(t) = 700 x_{\text{ВХ}}(t)$
19	$400 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 10 x_{\text{ВЫХ}}(t) = 8 \int_0^t x_{\text{ВХ}}(t) dt$
20	$\frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 10 \frac{dx_{\text{ВЫХ}}(t)}{dt} = 50 x_{\text{ВХ}}(t)$
21	$5 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 100 x_{\text{ВЫХ}}(t) = 5 \frac{dx_{\text{ВХ}}(t)}{dt}$
22	$8 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 10 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 16 x_{\text{ВЫХ}}(t) = 72 x_{\text{ВХ}}(t)$
23	$100 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 5 x_{\text{ВЫХ}}(t) = 10 x_{\text{ВХ}}(t)$
24	$10 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 10 x_{\text{ВЫХ}}(t) = 50 \int_0^t x_{\text{ВХ}}(t) dt$
25	$5 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 100 \frac{dx_{\text{ВЫХ}}(t)}{dt} = 50 x_{\text{ВХ}}(t)$
26	$3 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 30 x_{\text{ВЫХ}}(t) = 300 x_{\text{ВХ}}(t)$

27	$6 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 18x_{\text{ВЫХ}}(t) = 0,18 \frac{dx_{\text{ВХ}}(t)}{dt}$
28	$600 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 10x_{\text{ВЫХ}}(t) = 54 \int_0^t x_{\text{ВХ}}(t) dt$
29	$5 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 10 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 15x_{\text{ВЫХ}}(t) = 200x_{\text{ВХ}}(t)$
30	$9 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 18x_{\text{ВЫХ}}(t) = 0,9 \frac{dx_{\text{ВХ}}(t)}{dt}$
31	$55 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 11x_{\text{ВЫХ}}(t) = 110x_{\text{ВХ}}(t)$
32	$6 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 12 \frac{dx_{\text{ВЫХ}}(t)}{dt} = 48x_{\text{ВХ}}(t)$
33	$100 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 10x_{\text{ВЫХ}}(t) = 5000 \int_0^t x_{\text{ВХ}}(t) dt$
34	$40 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 4x_{\text{ВЫХ}}(t) = 88x_{\text{ВХ}}(t)$
35	$35 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 14 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 7x_{\text{ВЫХ}}(t) = 70x_{\text{ВХ}}(t)$
36	$7 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 35x_{\text{ВЫХ}}(t) = 0,35x_{\text{ВХ}}(t)$
37	$2 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 10 \frac{dx_{\text{ВЫХ}}(t)}{dt} = 5x_{\text{ВХ}}(t)$
38	$500 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 10x_{\text{ВЫХ}}(t) = 0,5 \frac{dx_{\text{ВХ}}(t)}{dt}$
39	$10 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 50x_{\text{ВЫХ}}(t) = 100 \int_0^t x_{\text{ВХ}}(t) dt$
40	$8 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 40x_{\text{ВЫХ}}(t) = 4x_{\text{ВХ}}(t)$
41	$3 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 30 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 6x_{\text{ВЫХ}}(t) = 60x_{\text{ВХ}}(t)$

42	$2,5 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 10 \frac{dx_{\text{ВЫХ}}(t)}{dt} = 50x_{\text{ВХ}}(t)$
43	$90 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 4,5x_{\text{ВЫХ}}(t) = 0,45x_{\text{ВХ}}(t)$
44	$54 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 9x_{\text{ВЫХ}}(t) = 0,9x_{\text{ВХ}}(t)$
45	$150 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 15x_{\text{ВЫХ}}(t) = 30 \int_0^t x_{\text{ВХ}}(t) dt$
46	$25 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 2x_{\text{ВЫХ}}(t) = 0,25 \frac{dx_{\text{ВХ}}(t)}{dt}$
47	$2 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 10 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 500x_{\text{ВЫХ}}(t) = 50x_{\text{ВХ}}(t)$
48	$9 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 90x_{\text{ВЫХ}}(t) = 0,45x_{\text{ВХ}}(t)$
49	$10 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 50x_{\text{ВЫХ}}(t) = 500 \int_0^t x_{\text{ВХ}}(t) dt$
50	$5 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 10 \frac{dx_{\text{ВЫХ}}(t)}{dt} = 5x_{\text{ВХ}}(t)$
51	$\frac{dx_{\text{ВЫХ}}(t)}{dt} + 55x_{\text{ВЫХ}}(t) = 11x_{\text{ВХ}}(t)$
52	$5 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 10x_{\text{ВЫХ}}(t) = 20 \frac{dx_{\text{ВХ}}(t)}{dt}$
53	$9 \frac{d^2 x_{\text{ВЫХ}}(t)}{dt^2} + 90 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 36x_{\text{ВЫХ}}(t) = 18x_{\text{ВХ}}(t)$
54	$45 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 9x_{\text{ВЫХ}}(t) = 27x_{\text{ВХ}}(t)$
55	$100 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 20x_{\text{ВЫХ}}(t) = 500 \int_0^t x_{\text{ВХ}}(t) dt$
56	$7 \frac{dx_{\text{ВЫХ}}(t)}{dt} + 7x_{\text{ВЫХ}}(t) = 70x_{\text{ВХ}}(t)$

57	$8 \frac{dx_{\text{БЫХ}}(t)}{dt} + 8x_{\text{БЫХ}}(t) = 4 \frac{dx_{\text{ВХ}}(t)}{dt}$
58	$6 \frac{dx_{\text{БЫХ}}(t)}{dt} + 36x_{\text{БЫХ}}(t) = 180x_{\text{ВХ}}(t)$
59	$25 \frac{d^2 x_{\text{БЫХ}}(t)}{dt^2} + 10 \frac{dx_{\text{БЫХ}}(t)}{dt} = 50x_{\text{ВХ}}(t)$
60	$7 \frac{d^2 x_{\text{БЫХ}}(t)}{dt^2} + 700 \frac{dx_{\text{БЫХ}}(t)}{dt} + 35x_{\text{БЫХ}}(t) = 70x_{\text{ВХ}}(t)$
61	$8 \frac{dx_{\text{БЫХ}}(t)}{dt} + 80x_{\text{БЫХ}}(t) = 4 \frac{dx_{\text{ВХ}}(t)}{dt}$
62	$6 \frac{dx_{\text{БЫХ}}(t)}{dt} + 360x_{\text{БЫХ}}(t) = 180x_{\text{ВХ}}(t)$
63	$\frac{d^2 x_{\text{БЫХ}}(t)}{dt^2} + 10 \frac{dx_{\text{БЫХ}}(t)}{dt} = 50x_{\text{ВХ}}(t)$
64	$7 \frac{d^2 x_{\text{БЫХ}}(t)}{dt^2} + \frac{dx_{\text{БЫХ}}(t)}{dt} + 2,5x_{\text{БЫХ}}(t) = 70x_{\text{ВХ}}(t)$
65	$\frac{dx_{\text{БЫХ}}(t)}{dt} + 5x_{\text{БЫХ}}(t) = 40 \frac{dx_{\text{ВХ}}(t)}{dt}$
66	$0,6 \frac{dx_{\text{БЫХ}}(t)}{dt} + 60x_{\text{БЫХ}}(t) = 180x_{\text{ВХ}}(t)$