

### ЗАДАЧА 11.

В электрической цепи указаны величины сопротивлений для первой гармоники. При воздействии на цепь несинусоидального напряжения  $U_0(t)$ , заданного в таблице вариантов, определить:

$A, V$  – показания амперметров и вольтметров, измеряющих действующие значения токов и напряжений;

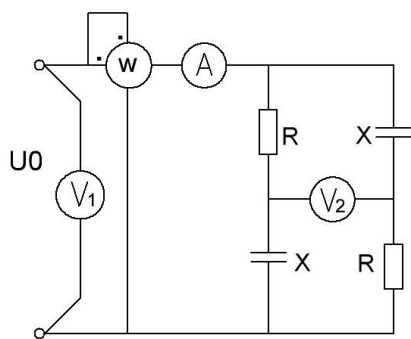
$P_w$  – показания ваттметра, измеряющего среднее значение мгновенной мощности

$$P_w = P_{cp} = \frac{1}{2\pi} \int_0^{2\pi} U \cdot i \cdot d(\omega t)$$

Таблица вариантов

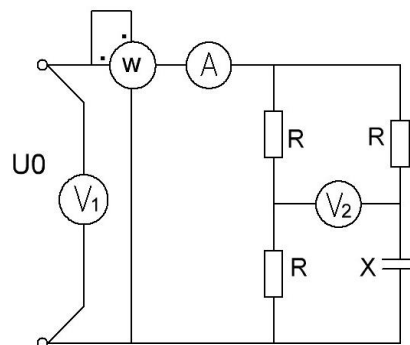
№ вар.	Напряжение $U_0(t)$
1	$U_0(t) = 30 + 120\sqrt{2} \sin \omega t - 40\sqrt{2} \sin 2\omega t, \quad B$
2	$U_0(t) = 80 + 120\sqrt{2} \sin \omega t + 90\sqrt{2} \sin 2\omega t, \quad B$
3	$U_0(t) = 120 + 160\sqrt{2} \sin(\omega t + \pi) - 150\sqrt{2} \sin 2\omega t, \quad B$
4	$U_0(t) = 90 + 200\sqrt{2} \sin \omega t + 120\sqrt{2} \sin(2\omega t + \pi), \quad B$
5	$U_0(t) = 60 - 240\sqrt{2} \sin \omega t + 80\sqrt{2} \sin 2\omega t, \quad B$
6	$U_0(t) = 160 + 240\sqrt{2} \sin \omega t + 180\sqrt{2} \sin(2\omega t + \pi), \quad B$
7	$U_0(t) = 150 + 300\sqrt{2} \sin \omega t + 100\sqrt{2} \sin(2\omega t - \pi), \quad B$
8	$U_0(t) = 210 - 280\sqrt{2} \sin(\omega t + \pi/2) + 120\sqrt{2} \sin(2\omega t - \pi/2), \quad B$
9	$U_0(t) = 90 - 360\sqrt{2} \sin \omega t + 120\sqrt{2} \sin 2\omega t, \quad B$
10	$U_0(t) = 240 + 320\sqrt{2} \sin \omega t + 90\sqrt{2} \sin(2\omega t + \pi), \quad B$
11	$U_0(t) = 320 + 300\sqrt{2} \sin \omega t - 240\sqrt{2} \sin 2\omega t, \quad B$
12	$U_0(t) = 240 - 400\sqrt{2} \sin \omega t + 180\sqrt{2} \sin 2\omega t, \quad B$
13	$U_0(t) = 270 + 360\sqrt{2} \sin(\omega t + \pi/2) - 240\sqrt{2} \sin 2\omega t, \quad B$
14	$U_0(t) = 480 + 160\sqrt{2} \sin \omega t + 120\sqrt{2} \cos(2\omega t + \pi), \quad B$
15	$U_0(t) = 250 - 480\sqrt{2} \sin \omega t - 360\sqrt{2} \sin 2\omega t, \quad B$
16	$U_0(t) = 600 + 240\sqrt{2} \cos \omega t + 70\sqrt{2} \cos 2\omega t, \quad B$
17	$U_0(t) = 600 - 200\sqrt{2} \sin \omega t + 150\sqrt{2} \sin 2\omega t, \quad B$
18	$U_0(t) = 320 + 480\sqrt{2} \sin \omega t + 360\sqrt{2} \sin(2\omega t + \pi), \quad B$
19	$U_0(t) = 240 - 560\sqrt{2} \sin \omega t + 420\sqrt{2} \sin 2\omega t, \quad B$
20	$U_0(t) = 450 + 430\sqrt{2} \cos \omega t - 360\sqrt{2} \cos 2\omega t, \quad B$
21	$U_0(t) = 600 + 360\sqrt{2} \sin \omega t - 270\sqrt{2} \sin 2\omega t, \quad B$
22	$U_0(t) = 720 + 240\sqrt{2} \sin \omega t + 180\sqrt{2} \sin(2\omega t - \pi), \quad B$

23	$U_0(t) = 180 + 640\sqrt{2} \sin \omega t - 480\sqrt{2} \sin 2\omega t, \quad B$
24	$U_0(t) = 110 + 480\sqrt{2} \cos \omega t - 360\sqrt{2} \cos 2\omega t, \quad B$
25	$U_0(t) = 300 + 600\sqrt{2} \sin \omega t - 200\sqrt{2} \sin 2\omega t, \quad B$
26	$U_0(t) = 400 + 720\sqrt{2} \sin \omega t + 210\sqrt{2} \sin 2\omega t, \quad B$
27	$U_0(t) = 400 - 600\sqrt{2} \cos \omega t + 450\sqrt{2} \cos 2\omega t, \quad B$
28	$U_0(t) = 750 + 320\sqrt{2} \sin \omega t - 240\sqrt{2} \sin 2\omega t, \quad B$
29	$U_0(t) = 48 - 72\sqrt{2} \cos \omega t + 54\sqrt{2} \cos 2\omega t, \quad B$
30	$U_0(t) = 90 + 32\sqrt{2} \sin \omega t - 24\sqrt{2} \sin 2\omega t, \quad B$



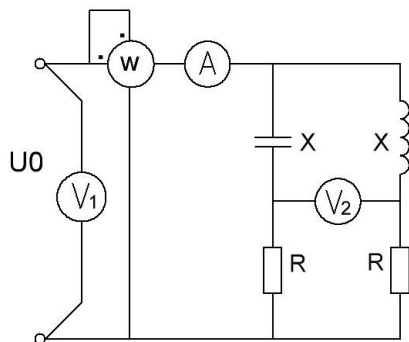
$R=X=5 \text{ Ohm}$

1.



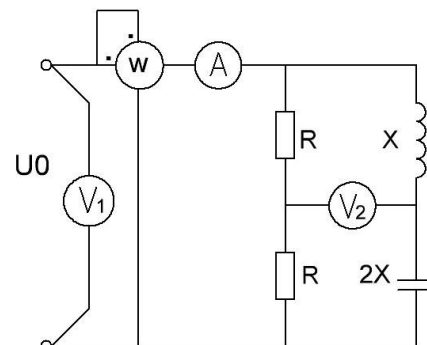
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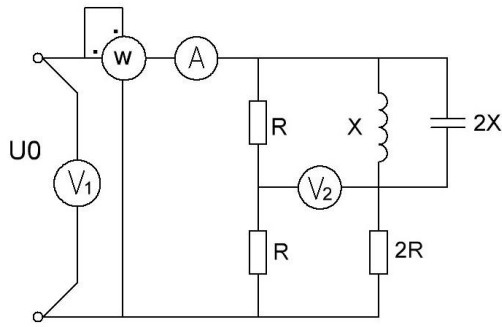
$R=X=20 \text{ Ohm}$

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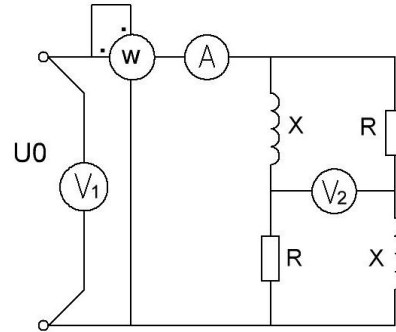
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4.



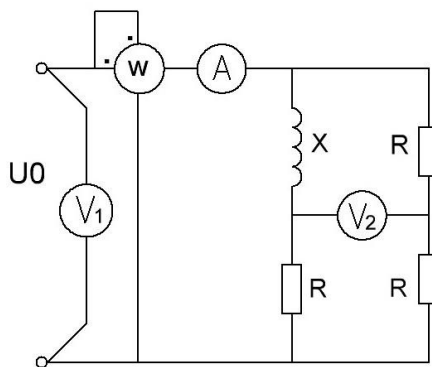
$$R=X=50 \text{ Ohm}$$

5.



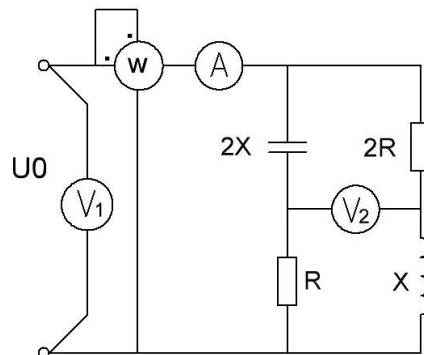
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6.



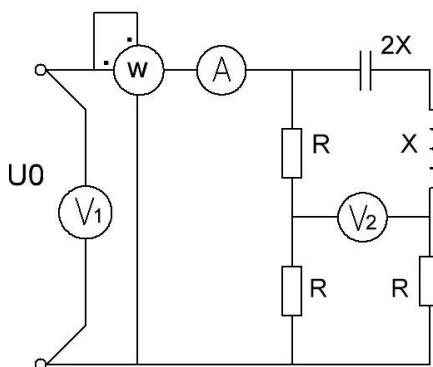
$$R=X=100 \text{ Ohm}$$

7.



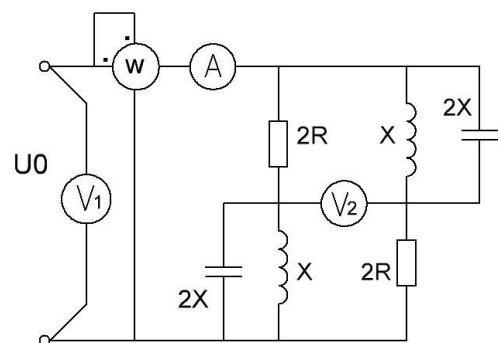
$$R=X=100 \text{ Ohm}$$

8.



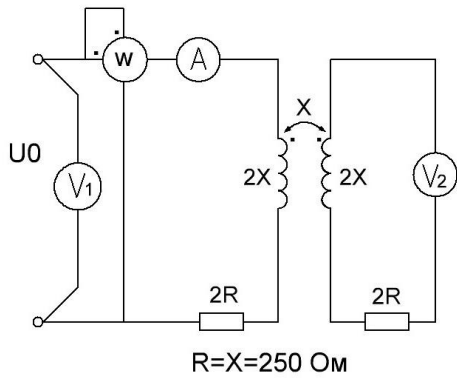
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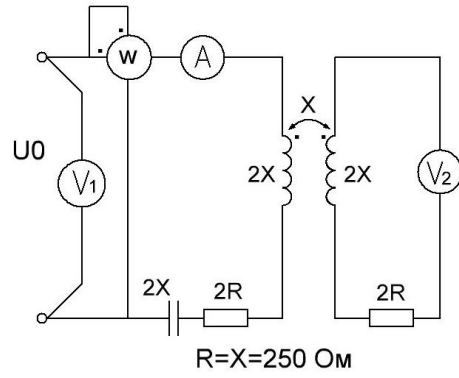


$$R=X=200 \text{ Ohm}$$

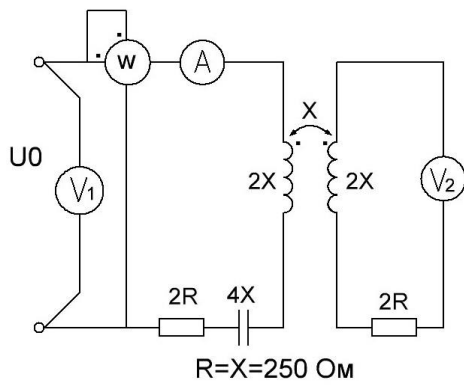
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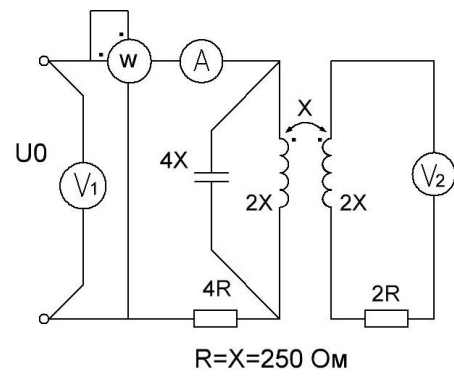
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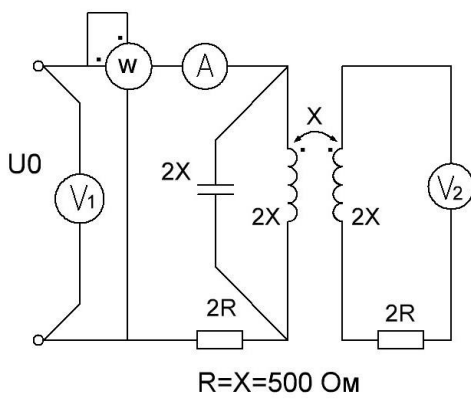
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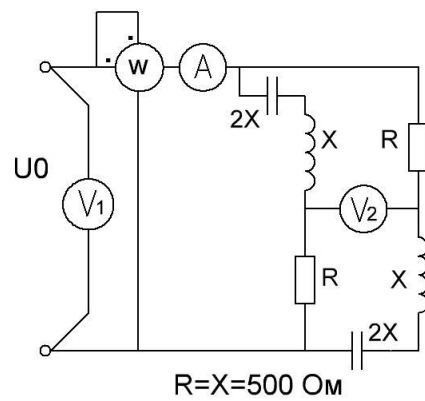
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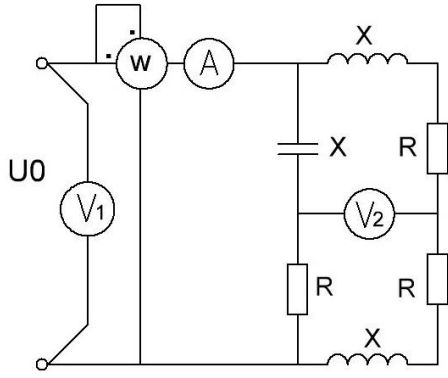
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15.

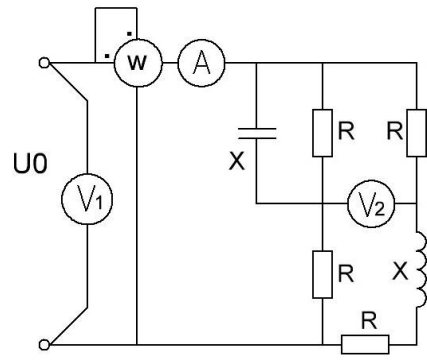


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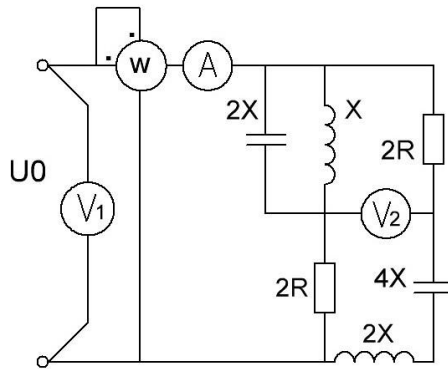
$$R=X=500 \text{ Ohm}$$

17.



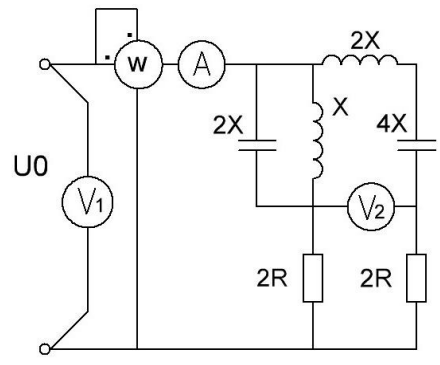
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18.



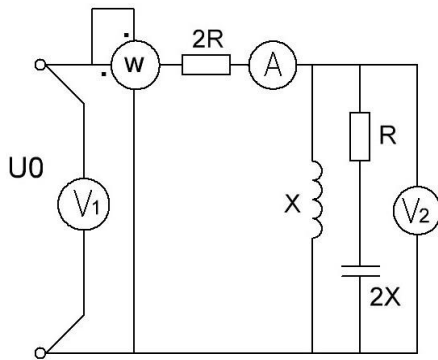
$$R=X=500 \text{ Ohm}$$

19.



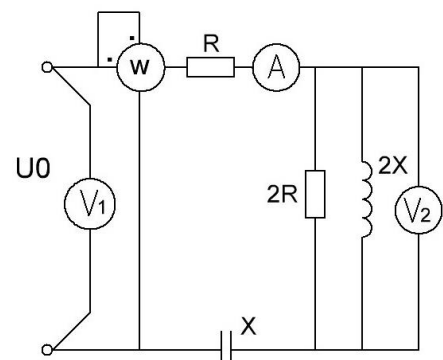
$$R=X=250 \text{ Ohm}$$

20.



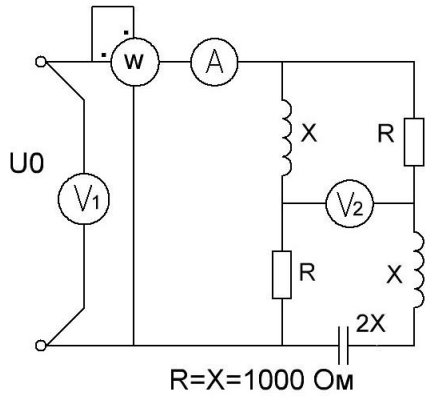
$$R=X=500 \text{ Ohm}$$

21.

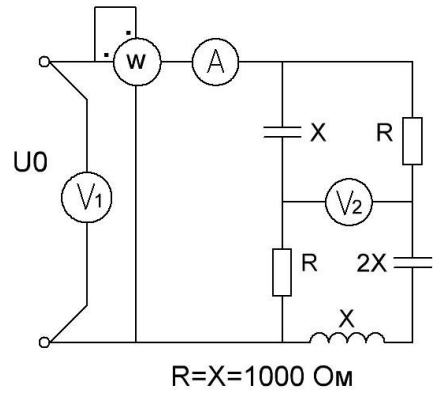


$$R=X=500 \text{ Ohm}$$

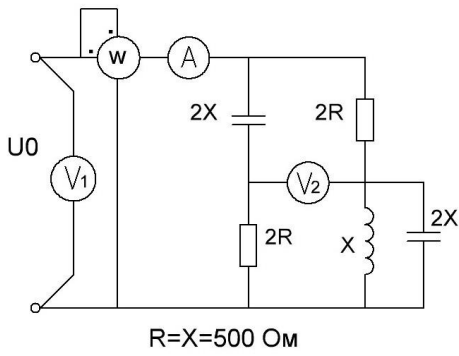
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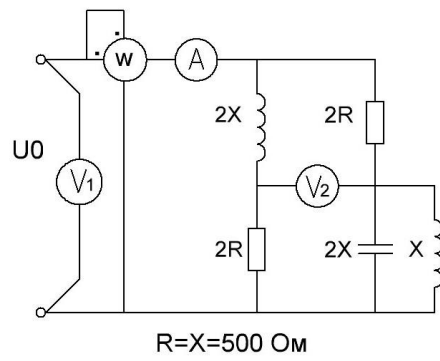
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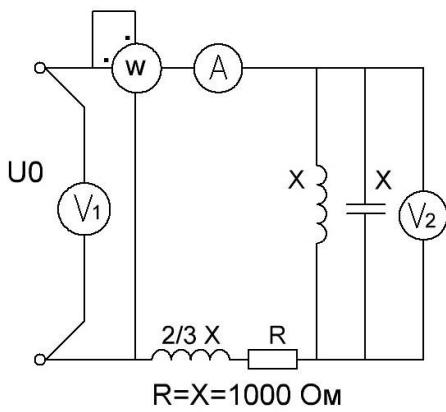
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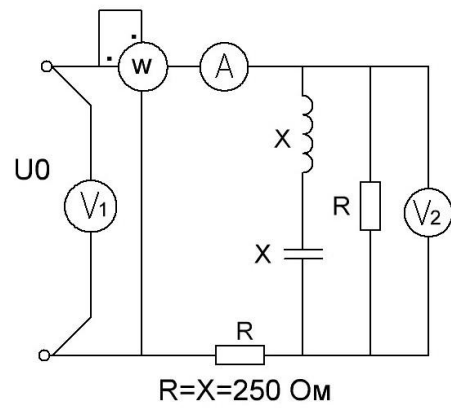
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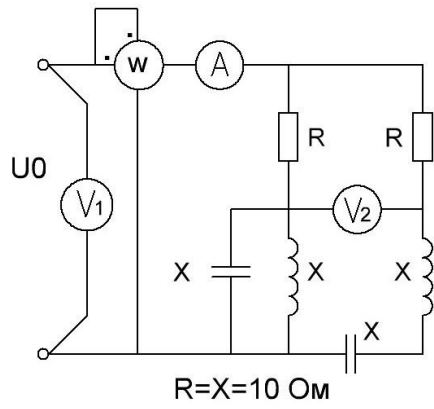
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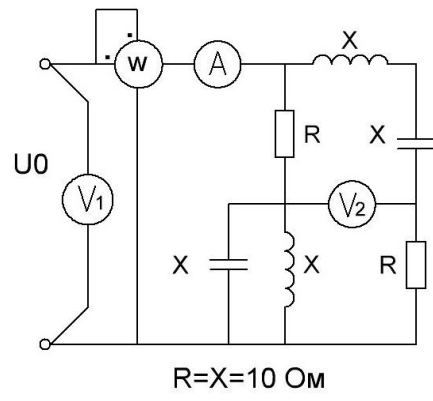
27.



28.



29.



30.