

Electricity problems 2.

1. The inductivity of a coil is 100 mH. The change of current intensity in it is 200 mA in 1 s. How large voltage is induced in the coil? (20 mV)
2. The sinusoidal voltage in a low-voltage network is $U_{\text{rms}} = 42 \text{ V}$. We put it to the oscilloscope. How large peak-to-peak voltage (U_{pp}) we can measure? (118.4 V)
3. How long is the period time of the normal “A” sound ($f = 440 \text{ Hz}$)? (2.27 ms)
4. How large current intensity is taken up by a 50 W, 12 V halogen lamp? ($I_{\text{rms}} = 4.17 \text{ A}$)
5. How strong cutout (possibilities: 6 A, 10 A, 16 A, 25 A, 40 A) do we need in the household, where the maximum of the used power is 5 kW? ($I_{\text{max}} = 21.7 \text{ A}$ so we need 25 A)
6. What can be the minimal and maximal value of the time constant of an RC circuit, if a capacitor of $C = 470 \text{ nF}$ is used and the resistance can be changed between 1 k Ω and 50 k Ω by the potentiometer? (470 μs – 23.5 ms)
7. The capacitive resistance is 1500 Ω in a 50 Hz AC circuit. How large is the capacity? (2.12 μF)
8. We want to tune an oscillatory circuit to 540 kHz to receive the transmission of a radio. The inductivity of the coil is 500 μH . How large should the capacity of the capacitor be? (174 pF)