Homework in Theory of Electrical Engineering. Nonsinusoidal steady state circuits analysis. University of Ruse Angel Kanchev.
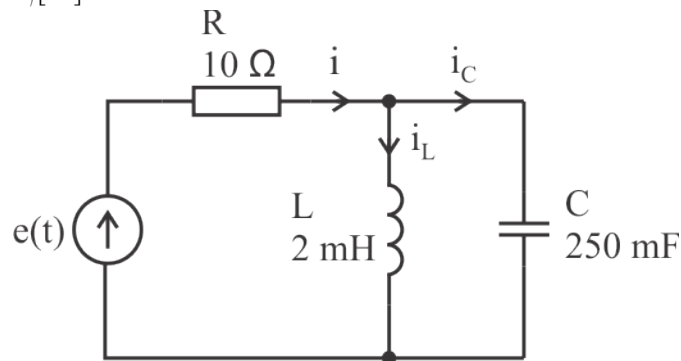
HOMEWORK №3

Problem 1. Sketch the nonsinusoidal voltage $u(t)=17+3\sin\omega t\,[V]$ **(5 points)**

Problem 2. Sketch the nonsinusoidal current $i(t)=-10\sin\omega t+1\sin 4\omega t\,[A]$ **(5 points)**:

Problem 3. The circuit is powered by a nonsinusoidal voltage source $e(t)=10+2\sin(300t)\,[V]$:

1) For each of the harmonic components <u>draw</u> an equivalent circuit and <u>estimate</u> the current i **(3+3 points)**;
2) Obtain the instantaneous current $i(t)$, it's RMS value I and the power dissipated by the resistor R **(4 points)**.

Problem 4. The circuit is powered by a nonsinusoidal voltage source $u(t)=5\sin(100t)-3\sin(200t)\,[V]$:
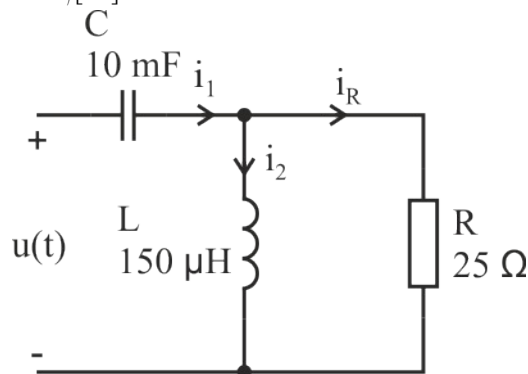
1) For each of the harmonic components <u>draw</u> an equivalent circuit and <u>estimate</u> the current i_R **(3+3 points)**;
2) Obtain the instantaneous current $i_R(t)$, it's RMS value I_R and the power dissipated by the resistor R **(4 points)**;