

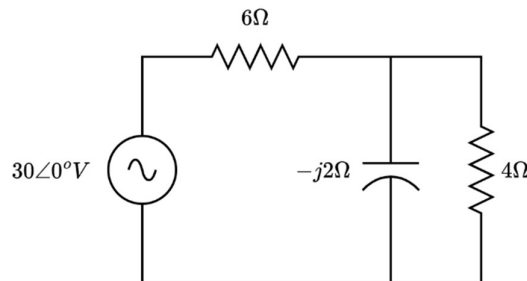
ESO203 Tutorial-3

Question 1:

Three impedances are in series: $Z_1 = 3.0\angle 45^\circ\Omega$, $Z_2 = 10\sqrt{2}\angle 45^\circ\Omega$, $Z_3 = 5.0\angle -90^\circ\Omega$. Find the applied voltage V , if the voltage across Z_1 is $27.0\angle -10^\circ V$.

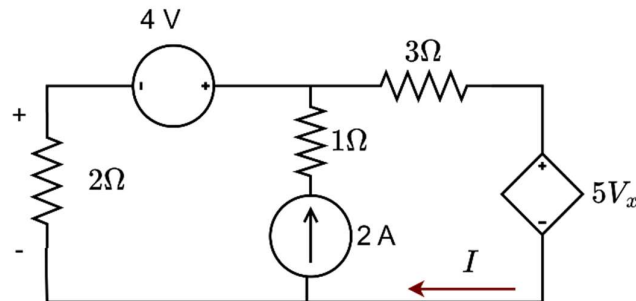
Question 2:

Determine the power factor of the entire circuit as seen by the source. Calculate the average power and apparent power delivered by the source.



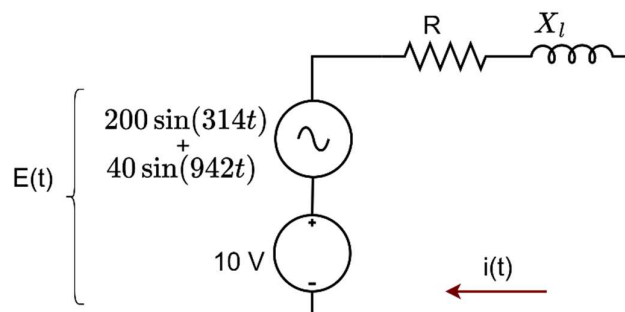
Question 3:

Find the current I in the given figure using the superposition theorem.



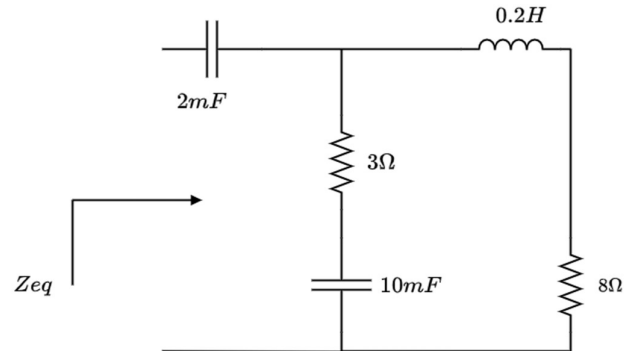
Question 4:

An RL series circuit with $R = 10$ ohms, $L = 0.0318$ H is energized with a voltage source $E(t) = 200 \sin(314t) + 40 \sin(942t + 30^\circ) + 10$ V. Determine the rms value of the current flowing in the circuit. Determine the rms value of the applied voltage source also.

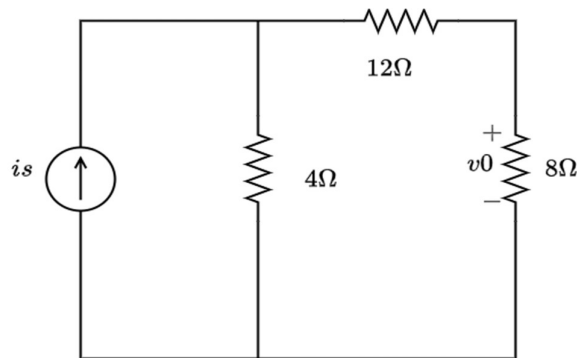


Question 5:

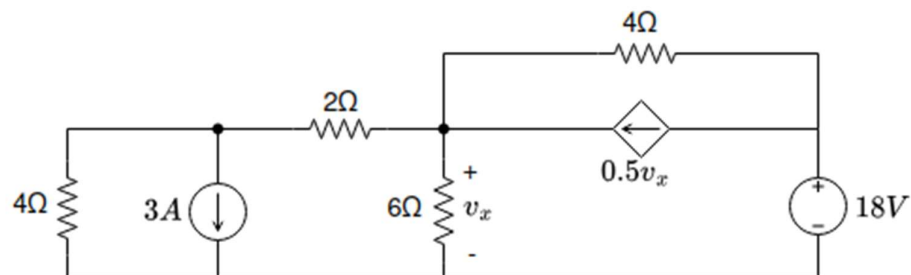
Find the input impedance and admittance of the circuit below which operates at the frequency, $\omega = 50 \text{ rad/s}$.

**Question 6:**

For the circuit below find v_0 when $i_s = 30\text{A}$ and $i_s = 45\text{A}$.

**Question 7:**

For the given circuit, find the voltage v_x using source transformations?

**Question 8:**

A single-phase AC load draws an apparent power of 10 kVA at a power factor of 0.8 lagging. Calculate the following:

- The real power (P) consumed by the load.
- The reactive power (Q) consumed by the load.
- The rms value of the current drawn by the load, If the supply voltage is 240 V (rms).