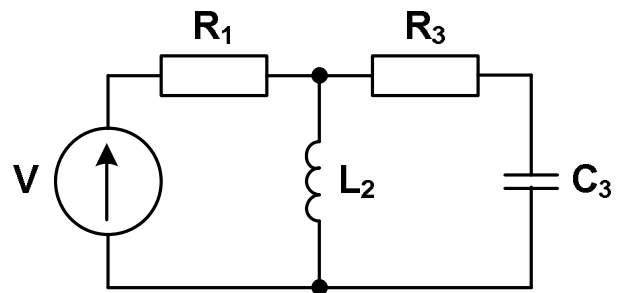


Module name: **Electrical Circuits 1**
 Module ID: **IS-FEE-10070W**
 Module type: **Class**
 Semester: **winter 2024/2025**
 Instructor: **Jarosław Forenc, j.forenc@pb.edu.pl**

Class 10 (09.01.2025)

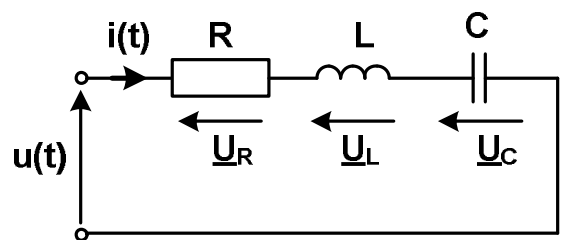
1. In the circuit as shown in the figure, the resistor R_3 has the maximum power of $P_3 = 8 \text{ W}$. Check if this is sufficient for the correct operation of the system.

$V = 24 \angle 60^\circ \text{ V}$, $R_1 = 4 \ \Omega$, $X_{L2} = 6 \ \Omega$,
 $R_3 = 8 \ \Omega$, $X_{C3} = 4 \ \Omega$.



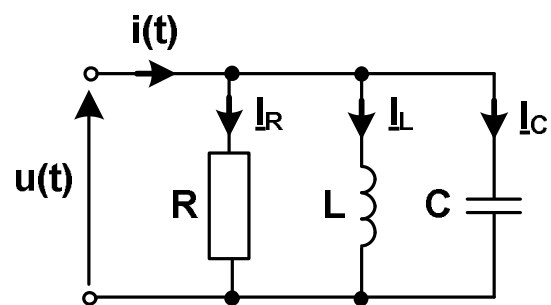
2. Calculate the current $i(t)$ and the voltage drops \underline{U}_R , \underline{U}_L , and \underline{U}_C in the circuit shown below. Draw a phasor diagram for this circuit.

$R = 20 \ \Omega$, $L = 20 \text{ mH}$, $C = 100 \ \mu\text{F}$,
 $u(t) = 100\sqrt{2}\cos(\omega t) \text{ V}$, $\omega = 10^3 \text{ rad/s}$.

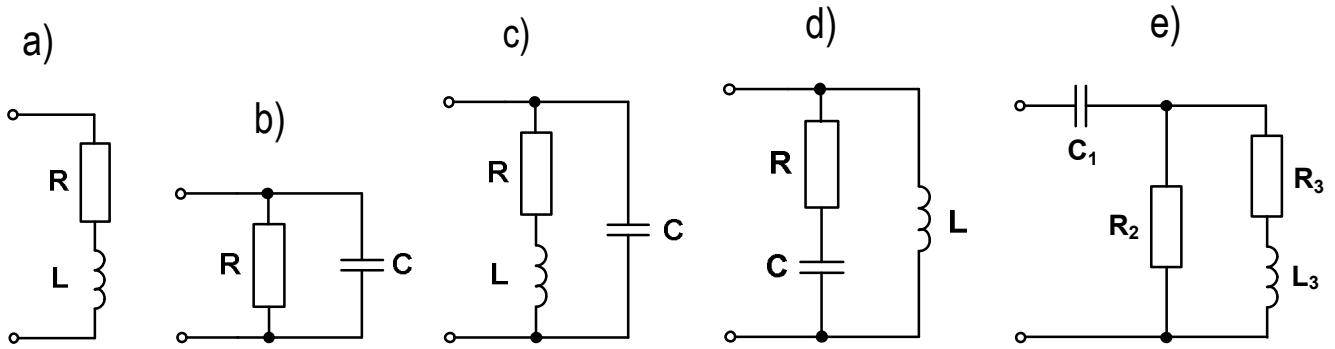


3. Calculate the currents $i(t)$, \underline{I}_R , \underline{I}_L , and \underline{I}_C in the circuit shown below. Draw a phasor diagram for this circuit.

$R = 20 \ \Omega$, $L = 20 \text{ mH}$, $C = 100 \ \mu\text{F}$,
 $u(t) = 100\sqrt{2}\cos(\omega t) \text{ V}$, $\omega = 10^3 \text{ rad/s}$.



4. Draw **phasor diagrams** for the following circuits.



5. Calculate all currents and voltages in the circuit shown in the figure. Determine the active, reactive, and apparent power consumed by the circuit. Draw a phasor diagram for the circuit. $\underline{U} = (10 + j10) \text{ V}$, $R_1 = 1 \text{ } \Omega$, $R_2 = 5 \text{ } \Omega$, $X_{C1} = X_{L2} = X_{L3} = 5 \text{ } \Omega$

