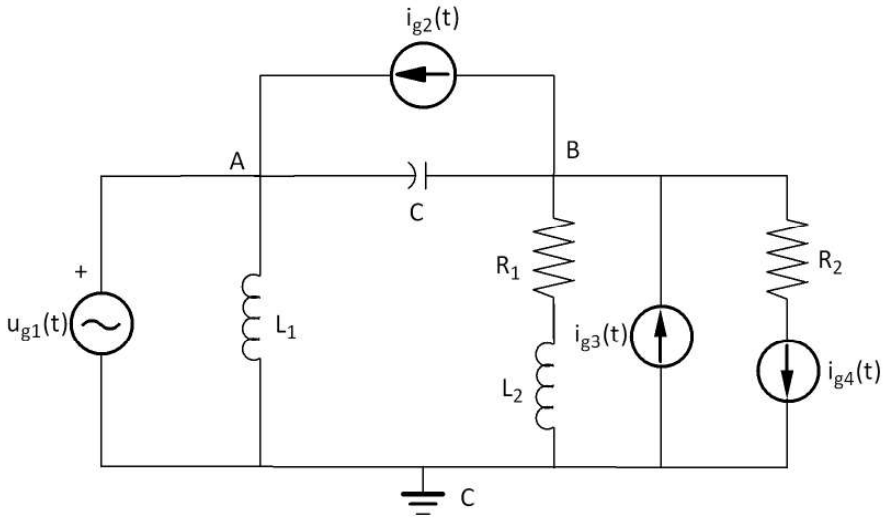
Electrical Power Engineering Fundamentals
Second partial exam, April 12th 2018

1. Solve the following circuit in the frequency domain using **nodal analysis** and obtain the phasors current at each branch.



R1=3 Ω; R2=1 Ω; L1=0.01 H; L2=0.02 H; C=0.01 F

$u_{g1}(t) = \sqrt{2} \cdot 100\cos(100t)V$

$i_{g2}(t) = \sqrt{2} \cdot 10\cos(100t + 90)A$

$i_{g3}(t) = \sqrt{2} \cdot 5\cos(100t)A$

$i_{g4}(t) = \sqrt{2} \cdot 3\cos(100t + 90)V$

2. Calculate the power balance of the circuit

3. Calculate the Thevenin equivalent of the circuit at terminals AB.

4. We connect an impedance $Z_{load} = R + jX\Omega$ at terminals AB as shown in the figure. Calculate the value of Zload knowing that the complex power generated by the Thevenin source in this situation is S=50+150j.