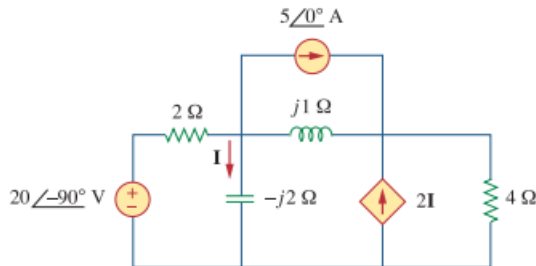


Assignment: 2

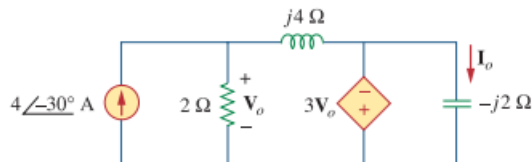
Electrical Circuits for Engineers (EC1000)

Sinusoidal Steady-State Analysis

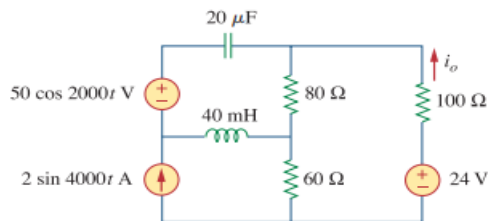
Q1. Find current I in the circuit using nodal analysis.



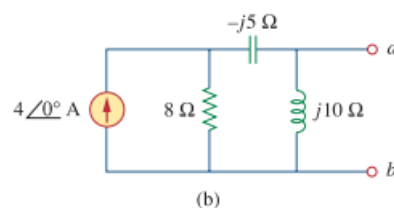
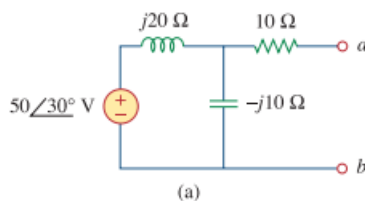
Q2. Determine V_o and I_o using mesh analysis.



Q3. Find current in given circuit. Use superposition theorem.

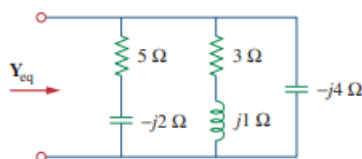


Q4. Find the Norton equivalent circuit at terminal a-b for the following circuits.

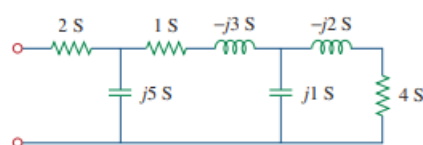


Sinusoids and Phasors

Q5 (a) Find the equivalent admittance of the circuit:

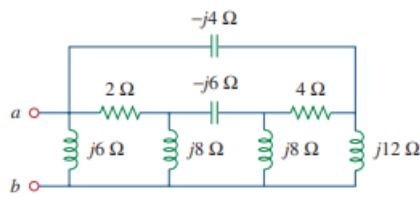


(i)

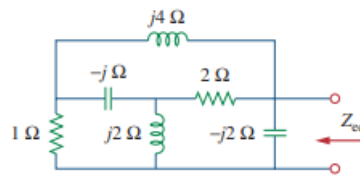


(ii)

(b) Find the equivalent impedance of the circuit:

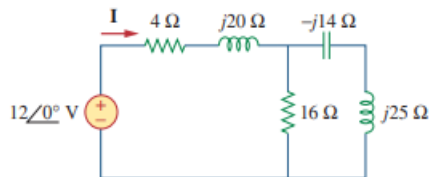


(i)

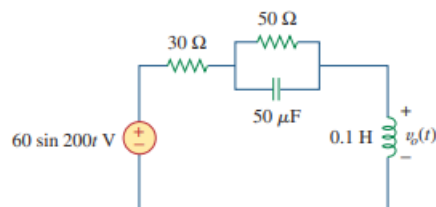


(ii)

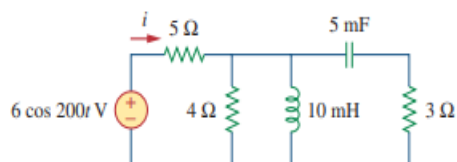
Q6. For the circuit shown, find equivalent impedance and use that to find current I . Let $\omega=10$ rad/s.



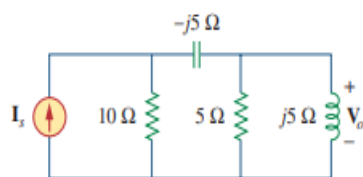
Q7. Calculate $V_o(t)$ in the circuit of given fig:



Q8. Calculate $i(t)$ in the circuit of given fig:

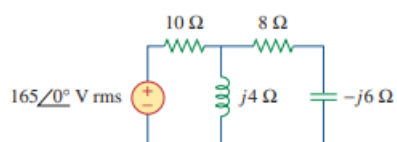


Q9. If $V_o = 8\angle 30^\circ$ V in the circuit given, find I_s .

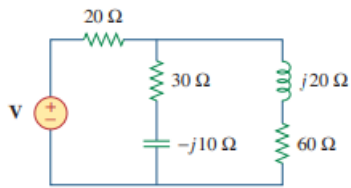


AC Power Analysis

Q10. Calculate the power factor of the entire circuit of Fig. as seen by the source. What is the average power supplied by the source?

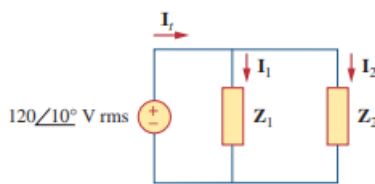


Q11. In the circuit below, the 60Ω resistor absorbs an average power of 240 W. Find V and the complex power of each branch of the circuit. What is the overall complex power of the circuit? (Assume the current through the resistor has no phase shift.)



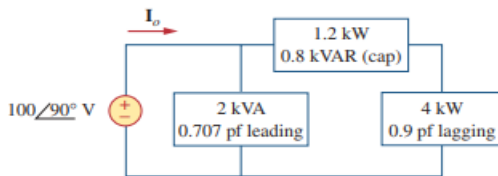
Q12. In the circuit, Calculate the total: (a) apparent power, (b) real power, (c) reactive power, and (d) pf, supplied by the source and seen by the source. given:

$$Z_1 = 60\angle -30^\circ \Omega \text{ and } Z_2 = 40\angle 45^\circ \Omega.$$



Q13. Two loads connected in parallel are respectively 2 kW at a pf of 0.75 leading and 4 kW at a pf of 0.95 lagging. Calculate the pf of the two loads. Find the complex power supplied by the source.

Q14. For given circuit, find I_o and the overall complex power supplied.



Q15. For given circuit, find I_o .

