



**UNIVERSITY OF REGINA
FACULTY OF ENGINEERING
1994 FALL MIDTERM EXAMINATION**

COURSE NUMBER: EENL 382
 COURSE TITLE: ELECTRIC POWER SYSTEMS
 INSTRUCTOR: JACK D. KATZBERG
 DATE: 13 October 1994
 TIME ALLOWED: 1 HOUR AND 15 MINUTES.
 INSTRUCTIONS: This is an open book exam.
 At Most, Three Bound Books are allowed.
 All questions are of equal value.

1. Assume that in the circuit of Figure 1, $R_1 = 70\Omega$, $L = 0.14H$, $C = 2.5\mu F$ and $R_2 = 800\Omega$. If the voltage source $v(t) = 60 \cos 1000t$, what is $v_b(t)$?

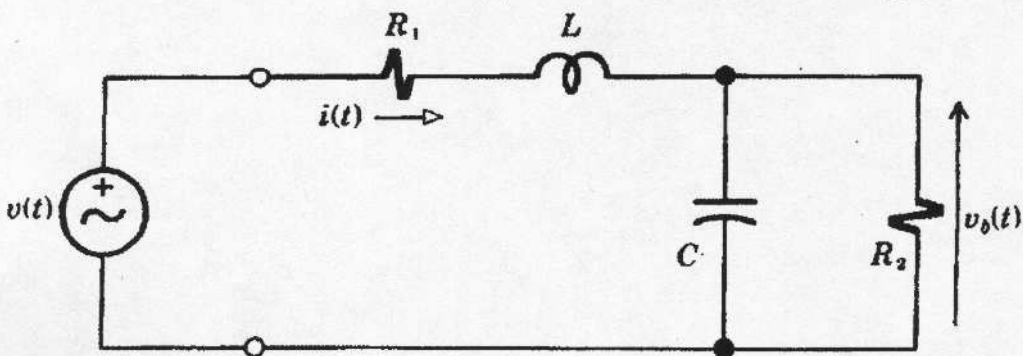


FIGURE 1

2. Assuming $\underline{V} = 100V \angle 0^\circ$ is a voltage phasor, the conductance, $G = 0.8s$ and the susceptance associated with the capacitor is $0.6s$, derive expressions for \underline{Y} the admittance of the network of Figure 2 and the currents \underline{I} , \underline{I}_G , \underline{I}_C . Draw a phasor diagram indicating the relationship between the voltages and currents.

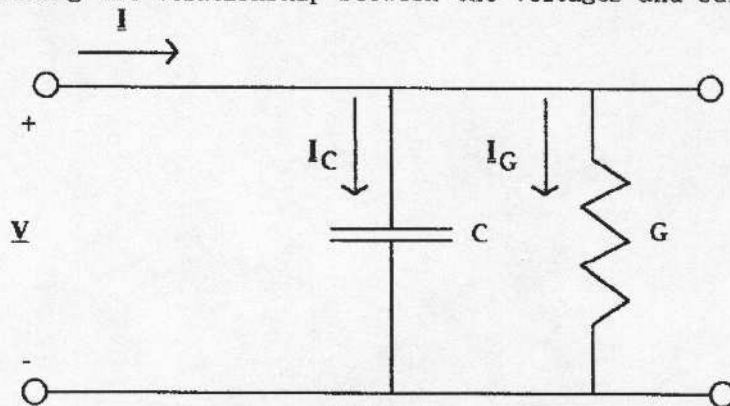


FIGURE 2

3. Consider an industrial load impedance $Z = (60\Omega + j80\Omega)$ connected to a 2.6kV power line.
- Calculate the apparent, real, and reactive powers for that impedance.
 - A capacitor is connected in parallel with Z to make the power factor, $pf = 1$. How much reactive power must be supplied. Calculate the power and current drawn from the power line.