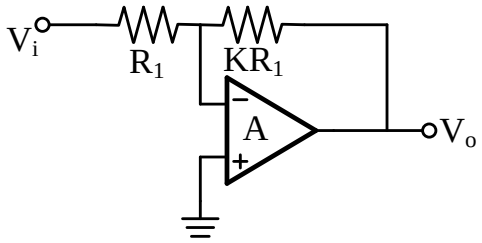
FALL 2015
ECEN 457 (ESS) **Due: October 20, 2015**

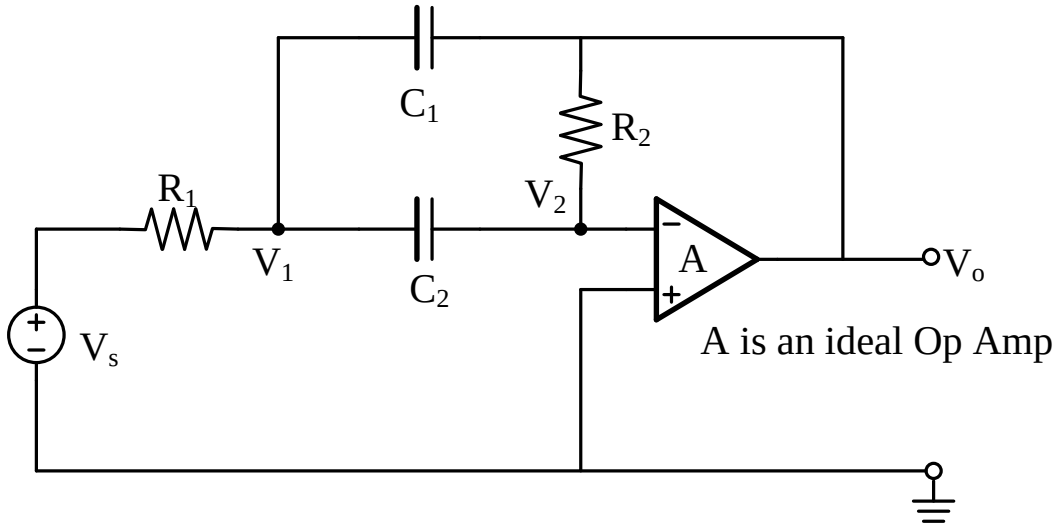
BONUS EXAM 457 (5 POINTS)

Problem. 1. i) Determine the value of A_o to yield a maximum gain error of ± 5% when K=3.



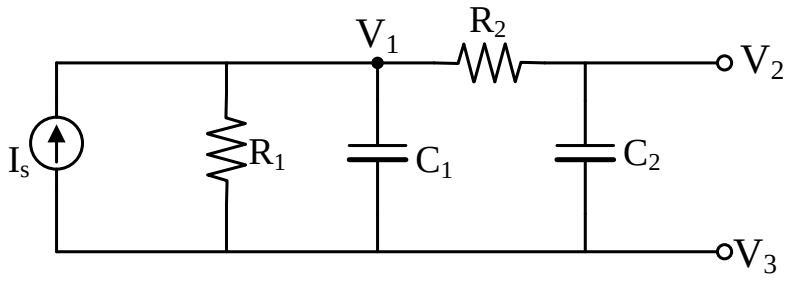
ii) For GB/s=A(s) and GB=10^6 Hz determine the error gain at $\omega = 2\pi \times 250$ Kr/s.

Problem 2. i) Write the nodal analysis for the circuit shown below:



ii) Determine the transfer function $H(s) = \frac{V_o(s)}{V_s(s)}$

Problem 3. i) Write the admittance matrix nodal equations YV=I.



ii) Obtain the impedance transfer function $Z_{in} = \frac{V_1(s)}{I(s)}$ for $V_3 = 0$. Write a simplified expression of Z_{in}.

iii) Plot Z_{in} for $R_1 = R_2 = 1K\Omega$ $C_1 = C_2 = (10^{-6}/2\pi)F$ and $\omega = 0.1$ to 10 Kr/s .

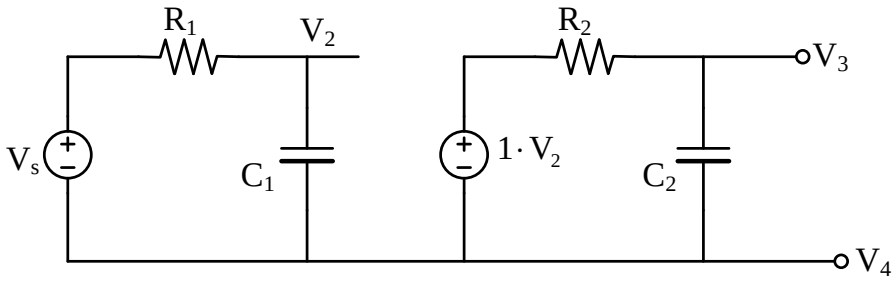
Problem 4. Determine if the following expressions are correct or not and why.

$$CV + RCI + I/\omega \qquad (1)$$

$$\frac{1}{sC_2 + sC_1} + \frac{1}{R_1} + \frac{1}{sL} \qquad (2)$$

$$sC_1 + \frac{1}{R_2} + \frac{R_2}{R_1}\frac{1}{sL} \qquad (3)$$

Problem 5. i) Write the admittance nodal analysis YV=I



ii) Obtain $V_3(s)/V_s$ for $V_4 = 0$

iii) Compare results from Prob. 3 ii) and the result in 5ii). Make comments.