ECE 333 — Latex Homework Examples

Name: John Doe
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Due Date: August 32, 2020, 9:00 AM
Assignment: 3

Problem 1: Solve for V_{out} in the circuit below:

$$V_{p1} = \left(\frac{R_1}{R_1+R_2}\right) V_1$$

$$\frac{V_{p1}-0}{R_3} + \frac{V_{p1}-V_{out1}}{R_4} = 0$$

$$\frac{1}{R_3}V_{p1} + \frac{1}{R_4}V_{p1} - \frac{1}{R_4}V_{out1} = 0$$

$$\frac{1}{R_4}V_{out1} = \frac{1}{R_3}V_{p1} + \frac{1}{R_4}V_{out1}$$

$$V_{out1} = \left(\frac{R_4}{R_3}+1\right) V_{p1}$$

$$\frac{V_{out1}}{V_{in}} = \left(\frac{R_4}{R_3}+1\right)\left(\frac{R_1}{R_1+R_2}\right)$$

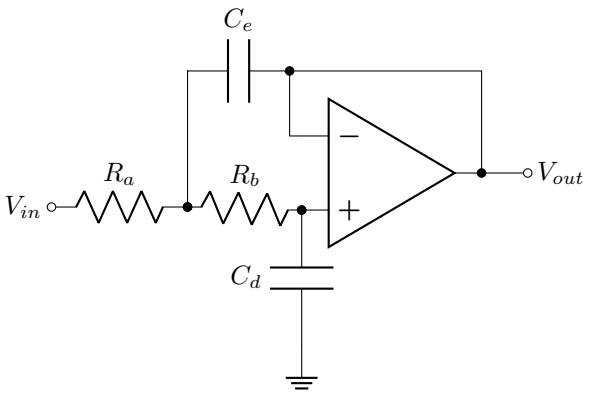
$$\frac{0-V_{out1}}{R_5} + \frac{0-V_{out2}}{R_6} = 0$$

$$-\frac{V_{out1}}{R_5} - \frac{V_{out2}}{R_6} = 0$$

$$-\frac{V_{out1}}{R_5} = \frac{V_{out2}}{R_6}$$

$$V_{out2} = -\left(\frac{R_6}{R_5}\right) V_{out1}$$

$$\boxed{\frac{V_{out}}{V_{in}} = \left(\frac{-R_6}{R_5}\right)\left(\frac{R_4}{R_3}+1\right)\left(\frac{R_1}{R_1+R_2}\right)}$$



Problem 2: Solve for V_{out} in the circuit below:

$$V_{p1} = \left(\frac{R_1}{R_1+R_2}\right) V_1$$

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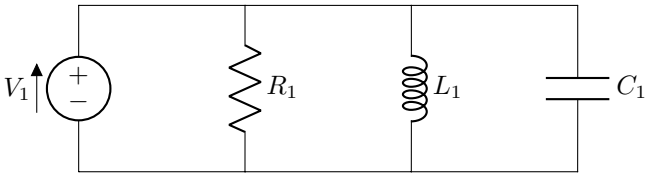
$$\boxed{\frac{V_{out}}{V_{in}} = \left(\frac{-R_6}{R_5}\right)\left(\frac{R_4}{R_3}+1\right)\left(\frac{R_1}{R_1+R_2}\right)}$$

$L_1 = 50\mu\text{H}$, $R_1 = 500\mu\Omega$, $C_1 = 700\mu\text{C}$



Problem 3: Solve for V_{out} in the circuit below:

$$V_{p1} = \left(\frac{R_1}{R_1+R_2}\right) V_1$$

$$\frac{V_{p1}-0}{R_3} + \frac{V_{p1}-V_{out1}}{R_4} = 0$$

$$\frac{1}{R_3}V_{p1} + \frac{1}{R_4}V_{p1} - \frac{1}{R_4}V_{out1} = 0$$

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$$V_{out1} = \left(\frac{R_4}{R_3}+1\right) V_{p1}$$

$$\frac{V_{out1}}{V_{in}} = \left(\frac{R_4}{R_3}+1\right)\left(\frac{R_1}{R_1+R_2}\right)$$

$$\frac{0-V_{out1}}{R_5} + \frac{0-V_{out2}}{R_6} = 0$$

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$L_1 = 50\mu\text{H}$, $R_1 = 500\mu\Omega$, $C_1 = 700\mu\text{C}$