

Solution of ECE 300 Test 5 F11

In the three-op-amp circuit below find the numerical values of the indicated voltages and currents.

$$i_2 = \frac{V_s}{R_1} = \frac{12\text{V}}{450\Omega} = 26.67\text{mA}$$

$$i_3 = I_s = 25\text{mA}$$

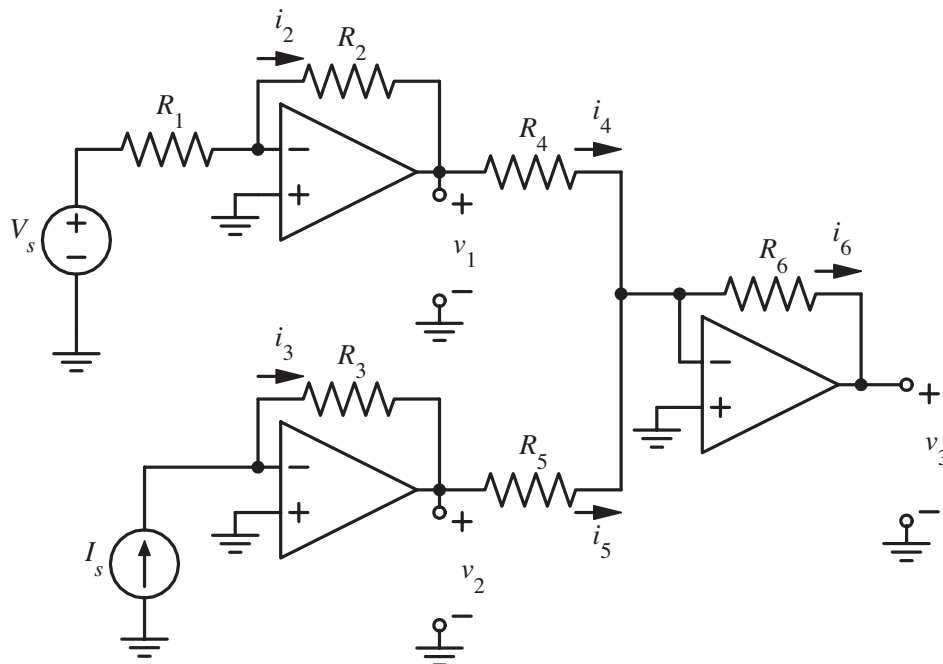
$$i_4 = \frac{v_1}{R_4} = \frac{-16.533\text{V}}{2000\Omega} = -8.267\text{mA}$$

$$i_5 = \frac{v_2}{R_5} = \frac{-13.5\text{V}}{3000\Omega} = -4.5\text{mA}$$

$$i_6 = i_4 + i_5 = -12.767\text{mA}$$

$$v_1 = -i_2 R_2 = -26.67\text{mA} \times 620\Omega = -16.533\text{V} \quad v_2 = -i_3 R_3 = -25\text{mA} \times 540\Omega = -13.5\text{V} \quad v_3 = -i_6 R_6 = 12.767\text{mA} \times 3000\Omega = 38.3\text{V}$$

$$V_s = 12\text{V} \quad , \quad I_s = 25\text{mA} \quad , \quad R_1 = 450\Omega \quad , \quad R_2 = 620\Omega \\ R_3 = 540\Omega \quad , \quad R_4 = 2\text{k}\Omega \quad , \quad R_5 = 3\text{k}\Omega \quad , \quad R_6 = 3\text{k}\Omega$$



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In the three-op-amp circuit below find the numerical values of the indicated voltages and currents.

$$i_2 = \frac{V_s}{R_1} = \frac{9\text{V}}{450\Omega} = 20\text{mA}$$

$$i_3 = I_s = 15\text{mA}$$

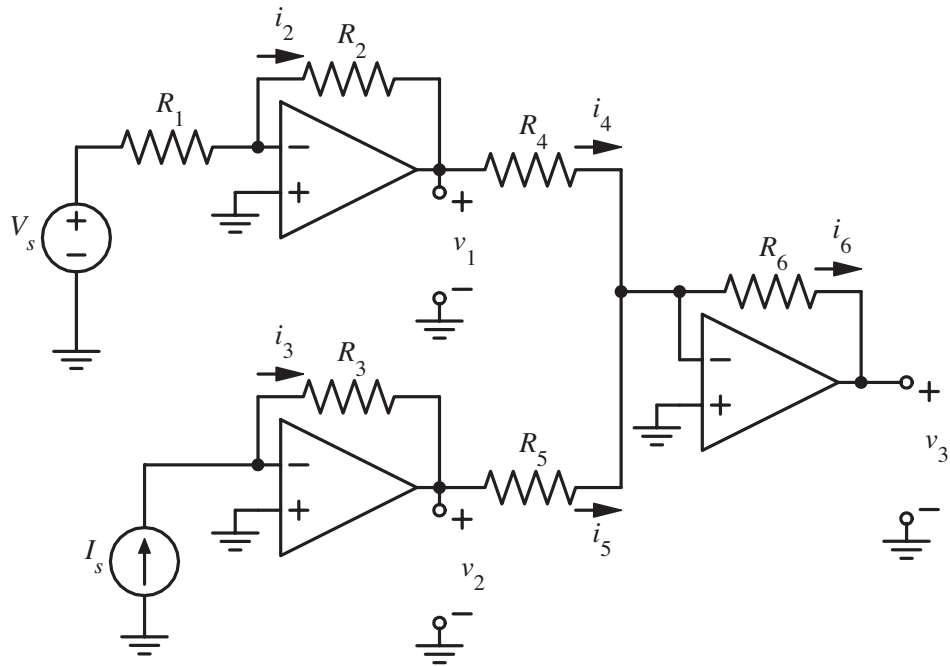
$$i_4 = \frac{v_1}{R_4} = \frac{-12.4\text{V}}{2000\Omega} = -6.2\text{ mA}$$

$$i_5 = \frac{v_2}{R_5} = \frac{-8.1\text{V}}{3000\Omega} = -2.7\text{mA}$$

$$i_6 = i_4 + i_5 = -8.9\text{mA}$$

$$v_1 = -i_2 R_2 = -20\text{mA} \times 620\Omega = -12.4\text{V} \quad v_2 = -i_3 R_3 = -15\text{mA} \times 540\Omega = -8.1\text{V} \quad v_3 = -i_6 R_6 = 8.9\text{mA} \times 3000\Omega = 26.7\text{V}$$

$$V_s = 9\text{V} \quad , \quad I_s = 15\text{mA} \quad , \quad R_1 = 450\Omega \quad , \quad R_2 = 620\Omega \\ R_3 = 540\Omega \quad , \quad R_4 = 2\text{k}\Omega \quad , \quad R_5 = 3\text{k}\Omega \quad , \quad R_6 = 3\text{k}\Omega$$



Solution of ECE 300 Test 5 F11

In the three-op-amp circuit below find the numerical values of the indicated voltages and currents.

$$i_2 = \frac{V_s}{R_1} = \frac{6V}{450\Omega} = 13.33\text{mA}$$

$$i_3 = I_s = 5\text{mA}$$

$$i_4 = \frac{v_1}{R_4} = \frac{-8.267V}{2000\Omega} = -4.133\text{mA}$$

$$i_5 = \frac{v_2}{R_5} = \frac{-2.7V}{3000\Omega} = -0.9\text{mA}$$

$$i_6 = i_4 + i_5 = -5.033\text{mA}$$

$$v_1 = -i_2 R_2 = -13.33\text{mA} \times 620\Omega = -8.267V \quad v_2 = -i_3 R_3 = -5\text{mA} \times 540\Omega = -2.7V \quad v_3 = -i_6 R_6 = 5.033\text{mA} \times 3000\Omega = 15.1V$$

$$V_s = 6V, \quad I_s = 5\text{mA}, \quad R_1 = 450\Omega, \quad R_2 = 620\Omega \\ R_3 = 540\Omega, \quad R_4 = 2\text{k}\Omega, \quad R_5 = 3\text{k}\Omega, \quad R_6 = 3\text{k}\Omega$$

