

# **ECEN 325 – Electronics**

**Fall 2020**

## **Lab 3: Prelab**



**Submitted by:**

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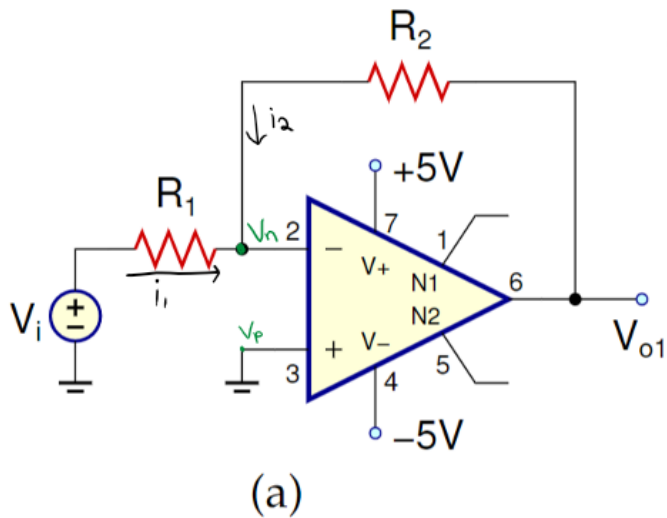
**Due: Sept 15<sup>st</sup>, 2020**

1.)

## **$\mu$ A741C**

- Supply Voltage:  $\pm 13\text{V}$
- Input Offset Voltage:  $1\text{mV}$
- Voltage Gain:  $\pm 12\text{V}$
- Power Consumption:  $50\text{mW}$
- Output Resistance:  $75\Omega$
- Bandwidth:  $30\mu\text{V/V}$
- Input Resistance:  $2\text{M}\Omega$
- Input Offset Current:  $20\text{nA}$
- Slew Rate:  $0.5\text{V}/\mu\text{s}$

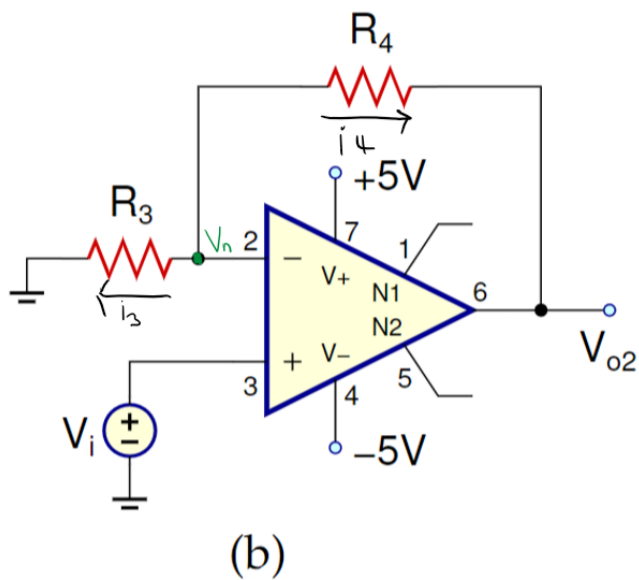
2.)



$$V_p = V_n = 0$$

$$i_1 = -i_2 \Rightarrow \frac{V_i}{R_1} = -\frac{V_{o1}}{R_2} \Rightarrow \frac{V_{o1}}{V_i} = -\frac{R_2}{R_1}$$

$$\boxed{\frac{V_{o1}}{V_i} = -\frac{R_2}{R_1}}$$



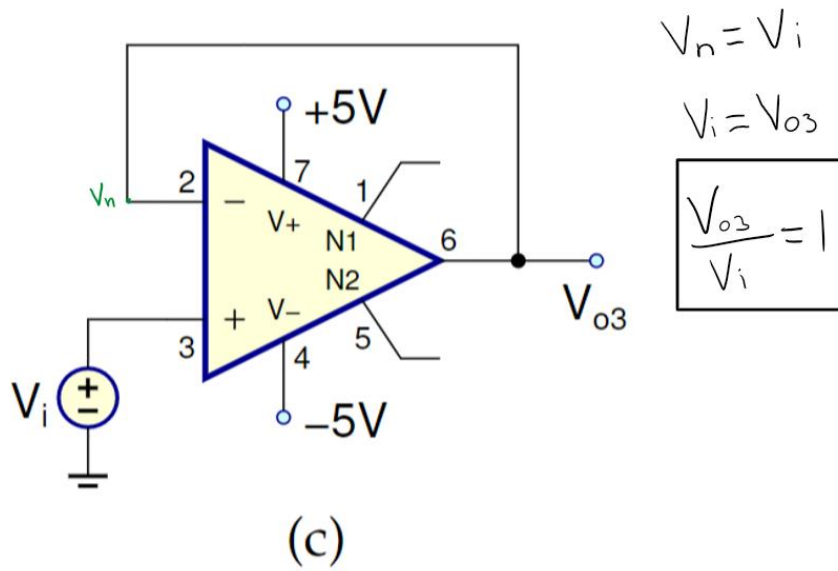
$$V_n = V_i, \sum i = 0$$

$$\text{node } n: \frac{V_i}{R_3} + \frac{V_i - V_{o2}}{R_4} = 0$$

$$V_i \left( \frac{1}{R_3 + R_4} \right) - \frac{V_{o2}}{R_4} = 0$$

$$V_i \left( \frac{1}{R_3 + R_4} \right) = \frac{V_{o2}}{R_4}$$

$$\frac{V_{o2}}{V_i} = \frac{R_4}{R_3 + R_4} \Rightarrow \boxed{\frac{V_{o2}}{V_i} = 1 + \frac{R_4}{R_3}}$$



3.)

$$R_1 = R_3 = 10 \text{ k}\Omega \quad , \quad \frac{V_{o1}}{V_i} = -3 \quad , \quad \frac{V_{o2}}{V_i} = 6$$

$$\frac{V_{o1}}{V_i} = -\frac{R_2}{R_1} \Rightarrow -3 = -\frac{R_2}{10 \text{ k}} \Rightarrow R_2 = 30 \text{ k}\Omega$$

$$\frac{V_{o1}}{V_i} = 1 + \frac{R_4}{R_3} \Rightarrow 6 = 1 + \frac{R_4}{10 \text{ k}} \Rightarrow R_4 = 50 \text{ k}\Omega$$