EECE 2150 - Electrical Engineering Fall 2023
Quiz 1

Prof. Charles A. DiMarzio

14 September 2023

Student Name: _____

On the next page is a simple circuit with a voltage source and two resistors. I know that $R_0 = 60$ Ohms and $R_L = 600$ Ohms. I measure 10 Volts as the voltage across R_L with the positive voltage at the top.

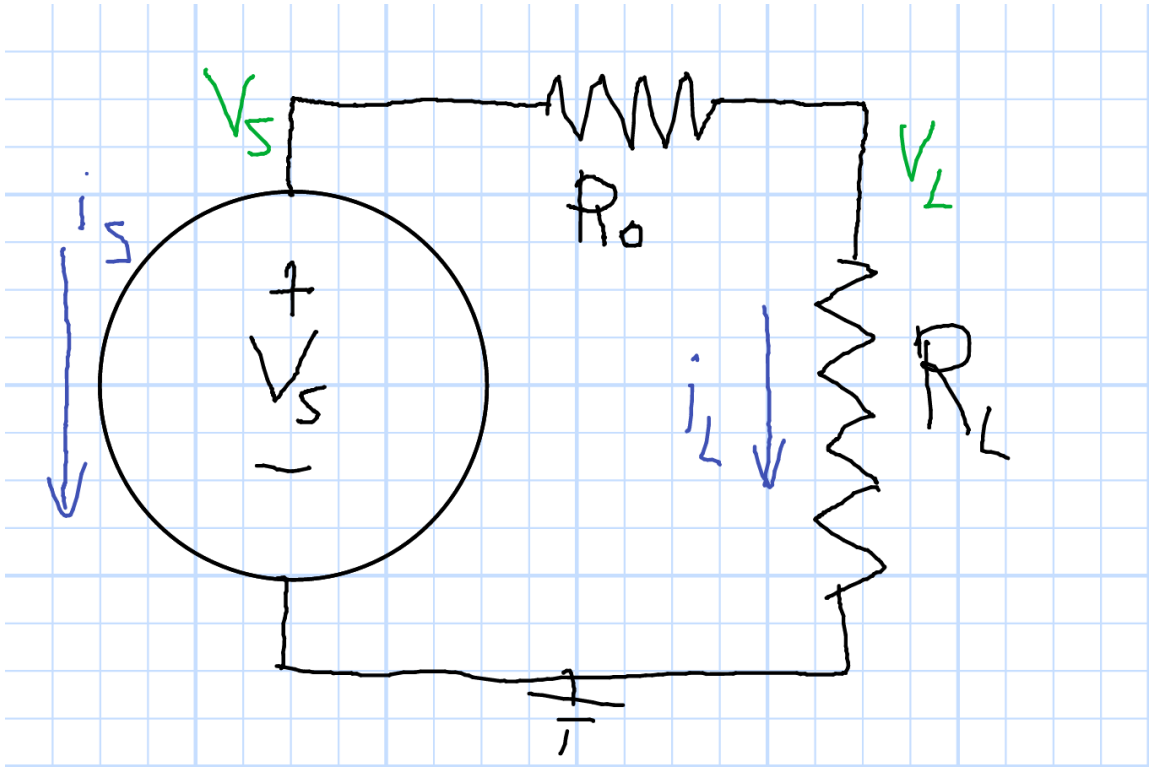1. What is the current, i_L?

_____

2. What is the current, i_S?

_____

3. What is the voltage across R_0, assuming positive at the left side and negative at the right?

_____

4. What is the source voltage, V_S?

_____

5. What is the Power absorbed by each component? What is the total power?

$P_S =$ _____ $P_0 =$ _____

$P_L =$ _____ $P_{Total} =$ _____

V_S

i_S

R_0

V_L

$+$

V_S

$-$

i_L

R_L

Solution

1. $i_L = \frac{V_L - 0}{R_L} = 0.0167\,\text{A} = 16.7\,\text{mA}$

2. $i_S = -i_L = -16.7\,\text{mA}$

3. $V_S - V_L = i_L R_0 = 1.00\,\text{V}$

4. $V_S = V_S - V_L + V_L = 11\,\text{Volts}$

5. $P_S = i_S v_S = -180\,\text{mW} \quad P_0 = i_L v_0 = 16.7\,\text{mW}$

$P_L = i_L v_L = 167\,\text{mW} \quad P_{Total} = 0$