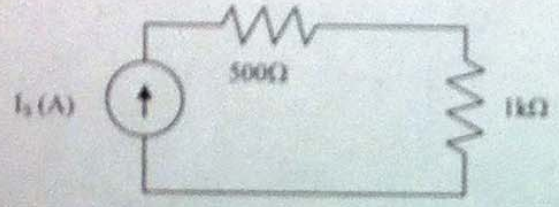
NAME: SOLUTIONS

EEE 202: Test 1

4 Problems, 30', Closed Book&Notes, 1 sheet of formulae allowed

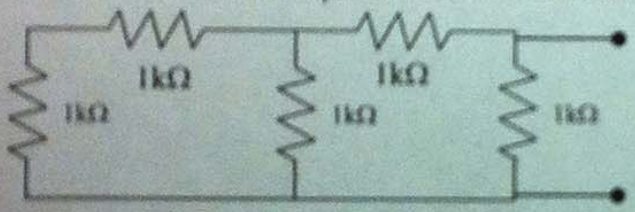
Problem 1. In the following circuit, the 1k resistance absorbs 2W of power. Find the value of the source current "I_s."



$P = V I_s = R I_s^2 \Rightarrow 2 = 1k\, I_s^2$

$\Rightarrow I_s = \sqrt{0.002} = \boxed{44.7\,mA}$

Problem 2. Find the equivalent resistance of the following network.

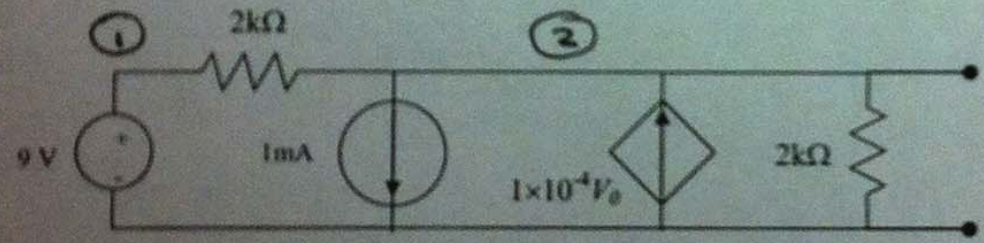


$R_{eq} = \left((1k+1k) \,\|\, 1k + 1k \right) \|\, 1k$

$2k \quad \Rightarrow \frac{2}{3}k \quad \Rightarrow \frac{5}{3}k \quad \Rightarrow \frac{1}{\frac{3}{5}+1}\,k$

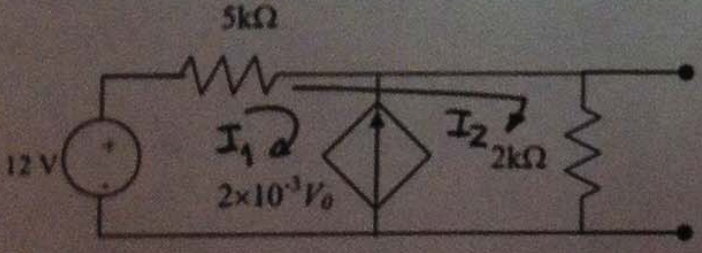
$= \boxed{\frac{5}{8}\,k\Omega}$

Problem 3. Use Nodal analysis to write a set of equations to compute V_o in the following circuit.



- $V_1 = 9$
- $\frac{V_1 - V_2}{2k} - 1m + 10^{-4} V_o + \frac{0 - V_2}{2k} = 0$
- $V_o = V_2$

Problem 4. Use Loop Analysis to write a set of equations to compute V_o in the following circuit.



- $I_1 = -2\cdot10^{-3} V_o$
- $-12 + (I_1 + I_2)\,5k + I_2\,2k = 0$
- $V_o = I_2\,2k$