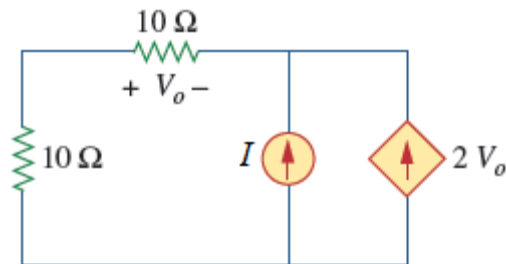


ENGR 065: Circuit Theory

Problem Set #3

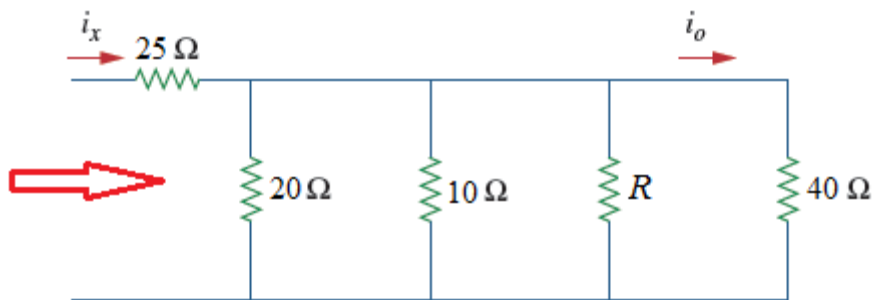
Read Chapter 2 from [1] and then solve the following problems:

Problem 1 [20%]: Find V_o and the power absorbed by the dependent source in the circuit below. Assume $I = 21$ A.

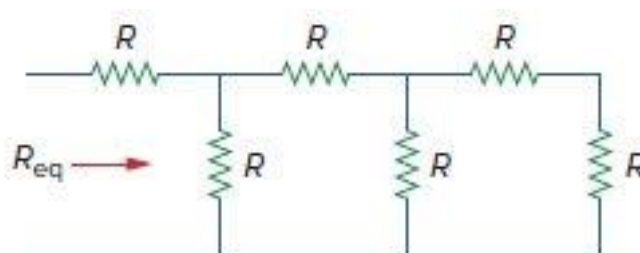


Problem 2 [20%]:

a) For the circuit in the figure below, $i_o = 5$ A and $R = 8\ \Omega$. Calculate i_x .



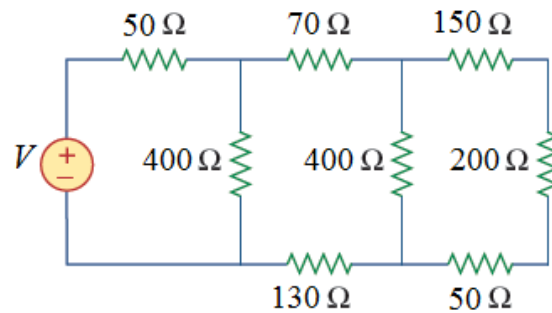
b) All resistors (R) in the figure below are $8\ \Omega$ each. Find R_{eq} .



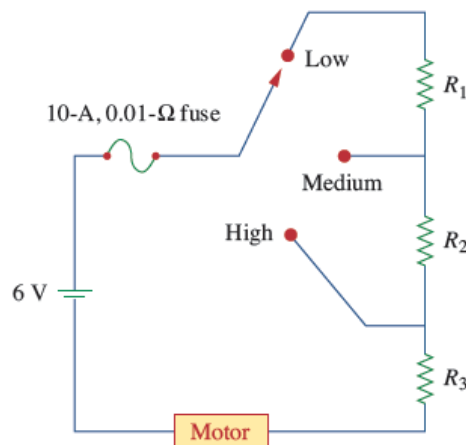
Problem 3 [20%]:

a) Using series/parallel resistance combination, find the equivalent resistance seen by the source in the circuit below. Find the overall absorbed power by the resistor network. Assume $V = 680$ V.

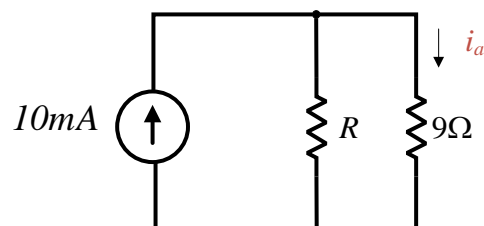
b) Compute the voltage across the $50\ \Omega$ resistor (which is connected in series with the voltage source).



Problem 4 [20%]: The circuit in the figure below is used to control the speed of an electric motor. The motor draws currents 6 A, 3 A, and 2 A when the switch is at high, medium, and low positions, respectively. The motor can be modeled as a load resistance of $20\ \text{m}\Omega$. The fuse can be modelled as a resistor of $0.01\ \Omega$. Determine the series resistors R_1 , R_2 , and R_3 .



Problem 5 [20%]: Compute the value of R such that the current flowing in the $9\ \Omega$ resistor is equal to $1\ \text{mA}$.



References

[1] C. Alexander and M. Sadiku “Fundamentals of Electric Circuits”, 7th Edition, 2021, McGraw-Hill