



UNITED INTERNATIONAL UNIVERSITY (UIU)

Dept. of Computer Science & Engineering

Course No: EEE 2113 Title: Electrical Circuits (Fall 2023)

Assignment - 1

Problems to solve:

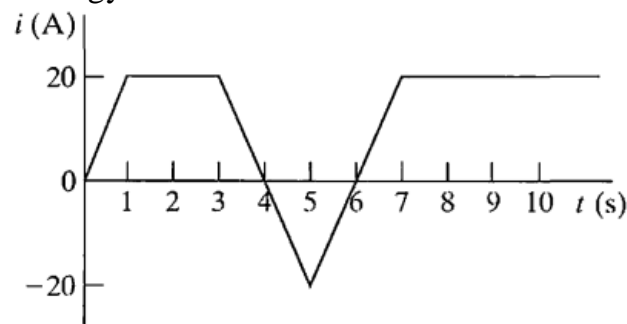
1. The voltage and current at the terminals of a circuit element are zero for $t < 0$.

For $t > 0$,

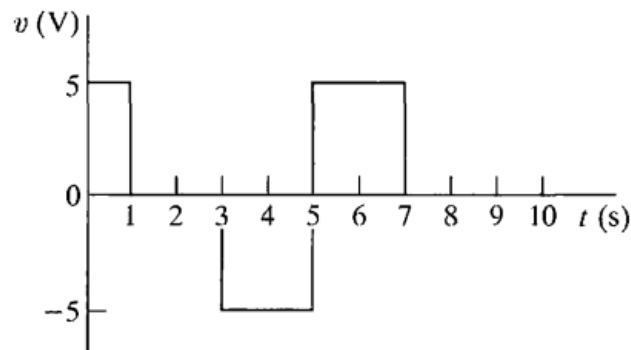
$$v = (16,000t + 20)e^{-800t} \text{ V},$$

$$i = (128t + 0.16)e^{-800t} \text{ A}.$$

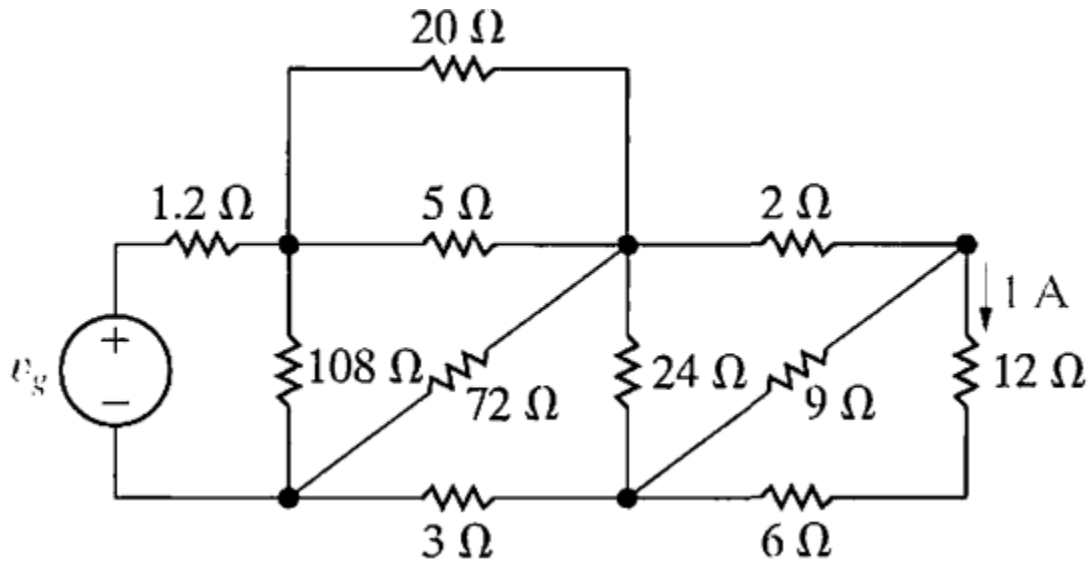
- a) At what instant of time is maximum power delivered to the element?
b) Find the maximum power in watts.
c) Find the total energy delivered to the element in millijoules. [20]
2. The voltage and current at the terminals of a circuit element are shown in Fig below. [20]
- a) Sketch the power versus time plot for $0 < t < 10$ s.
b) Calculate the energy delivered to the circuit element at $t = 1, 6$, and 10 s.



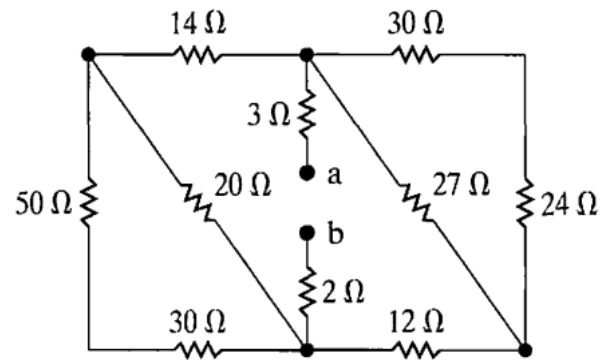
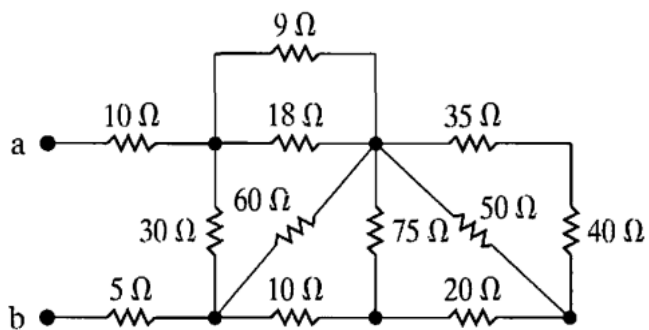
(a)



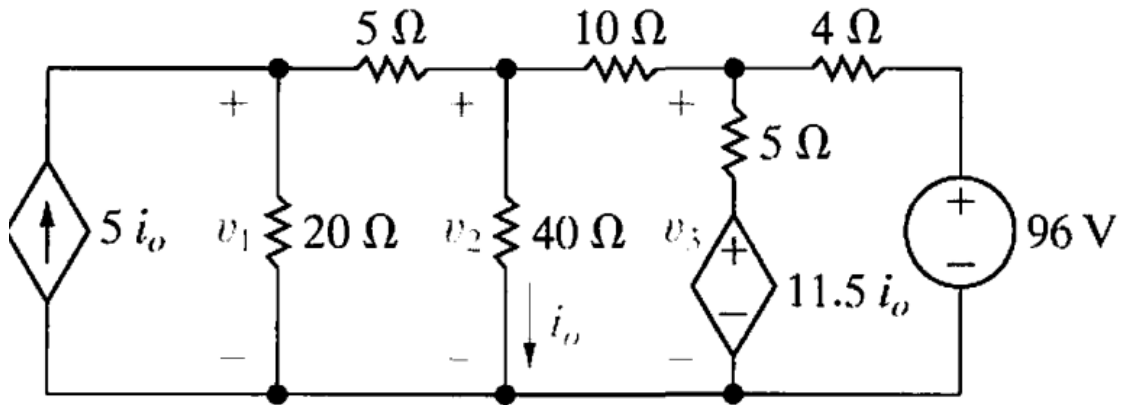
3. The current in the 12 ohm resistor in the circuit in Fig. below is 1 A, as shown.
- Find V_g .
 - Find the power dissipated in the 20 ohm resistor.[10]



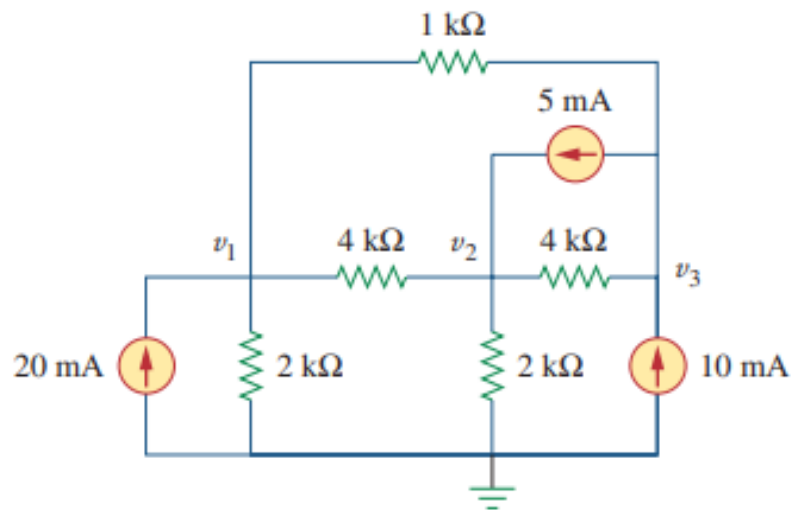
4. Find the equivalent resistance for each of the circuits in Fig. below. [10]



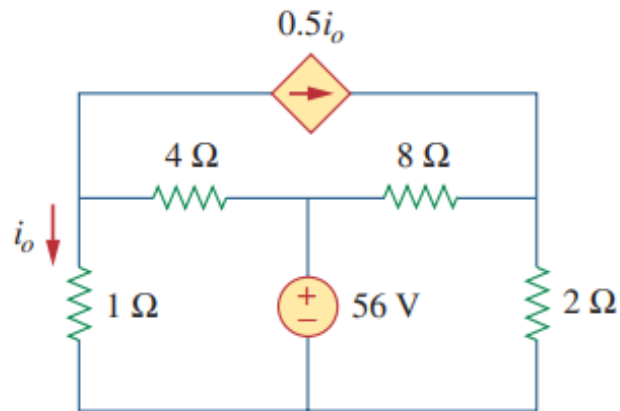
5. a) Find the **node voltages** V_1 , V_2 , and V_3 in the circuit in Fig. below.
 b) Find the total power dissipated in the circuit. [10]



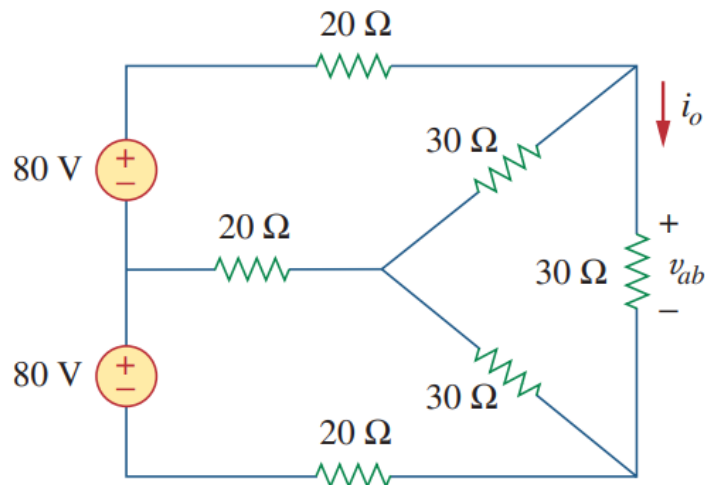
6. a) Determine the node voltages in the circuit shown below using node analysis.
 b) If 5mA current source is removed from the circuit, then determine the current through the two 2k ohm resistors as well as the node voltages using mesh analysis only. [10]



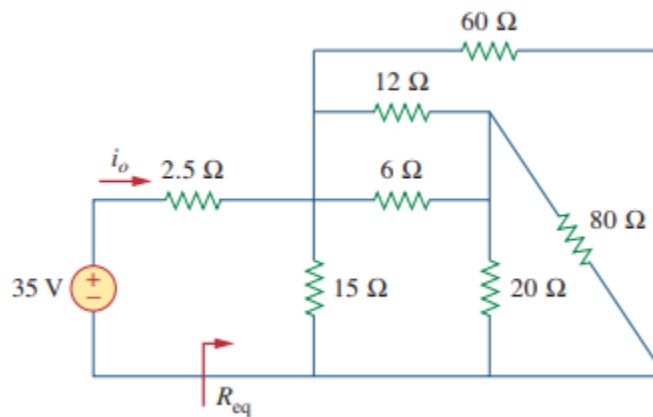
7. Determine the power dissipated in each resistor for the following circuit shown below. Use mesh or node analysis. [10]



8. Use mesh analysis to find v_{ab} and i_o and in the circuit [10]



9. Find R_{eq} and i_o :



10. Use nodal analysis to find V_o :

