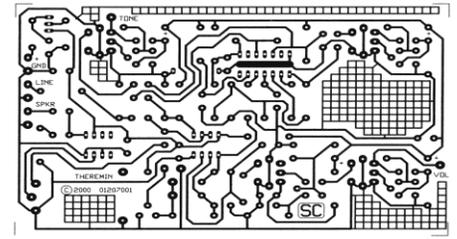
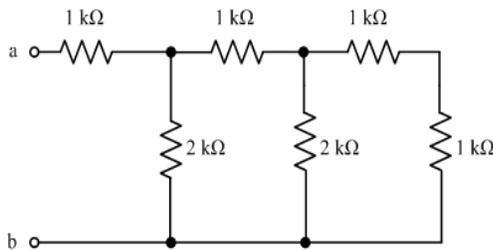


CURRENT AND CIRCUITS

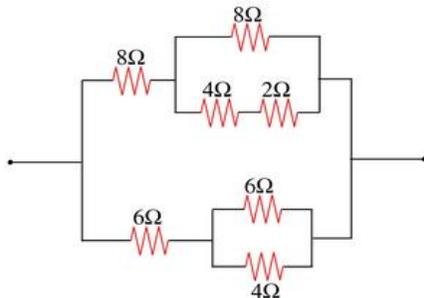


1. Calculate the resistance of a 4.00 meter length of copper wire having a diameter of 2.00 mm. Assume a temperature of 20 degrees Celcius.
2. A uniform aluminium wire has a resistance of 100 ohms. If the wire is cut into 10 equal lengths, the resistance of each piece will be equal to what?
3. A length of copper wire and a 1.00-meter-long silver wire have the same cross-sectional area and resistance at 20°C. Calculate the length of the copper wire.
4. A 10.0-meter length of copper wire is at 20°C. The radius of the wire is 1.0×10^{-3} meter. Calculate the resistance of the wire.
Ans: 5.5×10^{-2} ohms

5. Determine Req:



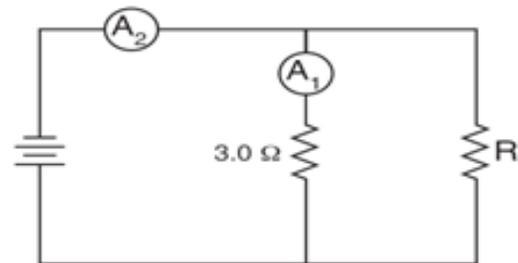
6. Determine Req:



7. A 4.5 ohm resistor is wired to a 9V battery. Draw this circuit. How many total electrons come from the battery in 2 seconds?
8. Two 15 ohm resistors are connected to a 6V battery in series. Determine the current coming

from the battery, the current through each resistor, and the voltage drop across each resistor.

9. A 15-ohm resistor and a 20.-ohm resistor are connected in parallel with a 9.0-volt battery. A single ammeter is connected to measure the total current of the circuit. Draw a diagram of this circuit using circuit symbols.
10. Two 15 ohm resistors are connected to a 6V battery in parallel. Determine the current coming from the battery, the current through each resistor, and the voltage drop across each resistor?
11. A 3.0-ohm resistor, an unknown resistor, R, and two ammeters, A₁ and A₂, are connected as shown with a 12-volt source. Ammeter A₂ reads a current of 5.0 amperes.

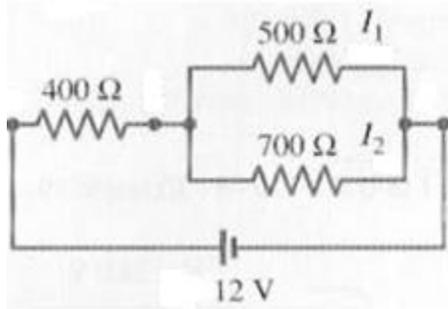


Calculate the resistance of the unknown resistor, R, calculate the current measured by ammeter A₁, determine the equivalent resistance of the circuit.

12. A circuit contains a 12.0-volt battery, an ammeter, a variable resistor, and connecting wires of negligible resistance. The variable resistor is a nichrome wire, maintained at 20.°C. The length of the nichrome wire may be varied from 10.0 centimeters to 90.0 centimeters. The ammeter reads 2.00 amperes when the length of the wire is 10.0 centimeters. Calculate the cross-sectional area of the nichrome wire.

13. A 5.0-ohm resistor, a 10.0-ohm resistor, and a 15.0-ohm resistor are connected in parallel with a battery. The current through the 5.0-ohm resistor is 2.4 amperes. A 20.0-ohm resistor is added to the circuit in parallel with the other resistors. Describe the effect the addition of this resistor has on the amount of electrical energy expended in the 5.0-ohm resistor in 2.0 minutes. Calculate the amount of electrical energy expended in the 5.0-ohm resistor in 2.0 minutes.

14. Determine the current through, voltage across, and power dissipated by every resistor in the circuit below:



15. Determine the current through, voltage across, and power by every resistor in the circuit below

