

INS Physics Workshop, April 20

1. Car batteries can be rated in ampere-hours. What *quantity* is being rated?
2. Explain why incandescent lightbulbs almost always burn out just as they are turned on and not after they have been on for some time.
3. Explain why is it dangerous to replace a 15-A fuse that repeatedly blows with a 25-A fuse.
4. A length of wire is cut in half and the two lengths are wrapped together side by side to make a thicker wire. How does the resistance of this new combination compare to the resistance of the original wire?
5.
 - a. Calculate the current that 60-W and 40-W bulbs draw if hooked individually to a household circuit.
 - b. Calculate the resistance of each bulb.
 - c. Calculate the current through each bulb if:
 - the bulbs are in parallel.
 - the bulbs are in series.
 - d. When the bulbs are in series, which burns brighter? Hint: look at the voltage across each bulb.
6. A 9.0-V battery whose internal resistance r is $0.50\text{-}\Omega$ is connected in the circuit shown in figure 1.
 - a. How much current is drawn from the battery?
 - b. What is the terminal voltage of the battery?
 - c. What is the current in the $6.0\text{-}\Omega$ resistor?