Resistance, Circuits, and Power

- 1. Complete the following sentences with words from the list below. (The words may be used more than once, and all words may not necessarily be used.)
 - (a) In a series circuit the ______ is the same through all resistors.
 - (b) The voltage is the same across resistors that are connect in ______.
 - (c) The rate at which energy is transferred is known as ______.
 - (d) When two batteries are connected in parallel their ______ adds together.
 - (e) The energy of moving charges is transformed into heat due to ______ in a wire.

Current	Power	Series
Parallel	Resistance	Voltage

- 2. In an electrical circuit, if the current increases while the resistance is constant, the voltage
 - (A) increases.
 - (B) decreases.
 - (C) remains constant.
- 3. Consider the following circuit.



If bulb A is removed, bulb B will

- (A) get brighter.
- (B) get dimmer.
- (C) glow just as brightly as before.
- (D) go out.

4. Consider the following circuit.



If bulb A is removed, bulb B will

- (A) get brighter.
- (B) get dimmer.
- (C) glow just as brightly as before.
- (D) go out.
- 5. Consider the following circuit.



If bulb A is removed, bulb C will

- (A) get brighter.
- (B) get dimmer.
- (C) glow just as brightly as before.
- (D) go out.
- 5. Draw a circuit diagram for a circuit containing three batteries (cells) in series, connected to three light bulbs in series.

6. Draw a circuit diagram of a circuit containing two batteries (cells) in series connected to two light bulbs in parallel, and a switch that controls both light bulbs at the same time.

7. Draw a circuit diagram of a circuit containing two batteries (cells) in series connected to two light bulbs in parallel and a resistor in series.

8. Why are the circuits in a house wired in parallel?

9. What is the purpose of a circuit breaker?

- 10. A car engine heater, rated at 750 W, is used for 8 hours each night. The cost is 9¢/kwh.
 - (a) Calculate the cost for
 - (i) 1 night.

(ii) $1 \mod (30 \text{ days})$.

(b) How much could you save each month if the heater is used only 4 hours each night?

11. An electric hot water heater, rated at 1500 W, is used for 5 hours a day, 20 days a month. Electricity costs \$0.09/kWh. Calculate the monthly cost of using the hot water heater.