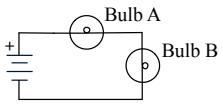
Circuit Practice **Physics II**

Name _____

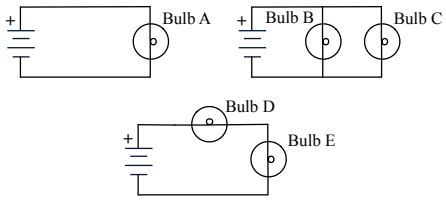
Date _____ **Period** _____

1. Below are pictured two identical light bulbs connected to a battery. Compare the brightness of Bulb A to that of Bulb B.

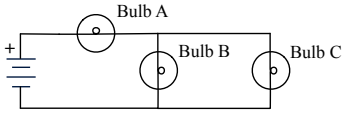


   (a) Bulb A is brighter than Bulb B.
   (b) Bulb A is as bright as Bulb B.
   (c) Bulb A is dimmer than Bulb B.

2. Rank the bulbs in the following three circuits in the order of their brightness from least to greatest. All bulbs are alike, and so are the power supplies.

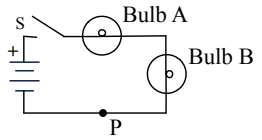


3. In the following circuit all light bulbs are identical. The connections are made with copper wiring. Light Bulb A is glowing brightly. Which choice best describes the brightnesses of the other bulbs?



   (a) Bulb B and Bulb C are both just as bright as Bulb A.
   (b) Bulb B is just as bright as Bulb A, but Bulb C is not as bright.
   (c) Bulb B and Bulb C are glowing but not as brightly as Bulb A.
   (d) Bulb B and Bulb C are not glowing at all.

For the next six items



4. When switch "S" is closed in the circuit shown above, Bulb A lights up before / at that same time as / after Bulb B.

5. The reason for your answer in the previous question is that
   (a) conduction electrons take some time to travel through the wire.
   (b) conduction electrons all begin to move at the same time throughout the wire.
   (c) Bulb B is farther away from the power supply.

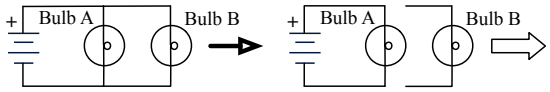
6. The electric current passing through Bulb A is (less than / equal to / greater than) the current passing through Bulb B when Switch S is closed.

7. In which direction do electrons flow at point P in the circuit shown above when switch S is closed?
   (a) leftward
   (b) upward
   (c) rightward
   (d) downward

8. Once the switch is closed, how does the amount of current passing through Bulb A, i_A , compare to the amount of current passing through Bulb B, i_B?
   (a) $i_A > i_B$
   (b) $i_A = i_B$
   (c) $i_A < i_B$

9. Where were the electrons that first make Bulb A light up just before the switch is closed?
   (a) They were in the battery.
   (b) They were in Bulb A.

10. When Bulb B is removed from the circuit below, Bulb A



(a) remains as bright as before.

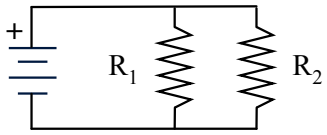
(b) becomes brighter.

(c) becomes fainter.

(d) goes out.

11. Your automobile battery is able to generate an electric current of 50 Amps when you attempt to start your car. Suppose you turn the key and run the starter for 5 seconds. How many coulombs of electric charge will pass through the battery during that time?

12. You measure the current flowing through R_1 and through R_2 in the circuit shown below. You find that the current through R_2 is less than the current flowing through R_1. The reason for this must be that



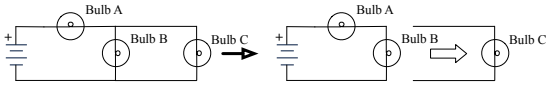
(a) $R_1 > R_2$

(b) $R_1 = R_2$

(c) $R_1 < R_2$

(d) R_2 is farther from the power supply.

For the next three items
You note the brightness of each of the three bulbs shown in the circuit shown below. Then Bulb C is removed and the brightness of each bulb is again noted.

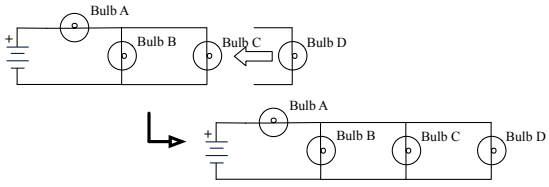


13. When Bulb C is removed, the brightness of Bulb A **increases / decreases / remains the same**.

14. When Bulb C is removed, the brightness of Bulb B **increases / decreases / remains the same**.

15. When Bulb C is removed, the amount of current flowing from the power supply **increases / decreases / remains the same**.

For the next three items
You note the brightness of each of the three bulbs shown in the circuit shown below. Then Bulb D is added to the circuit, and the brightness of each bulb is again noted.



16. When Bulb D is added, the brightness of Bulb A **increases / decreases / remains the same**.

17. When Bulb D is added, the brightness of Bulb B **increases / decreases / remains the same**.

18. When Bulb D is added, the amount of current flowing from the power supply **increases / decreases / remains the same**.

19. What happens to the total resistance of a circuit when more resistors are added in series? in parallel?

20. A current of 3 A flows through a 4 Ω resistor.

    (a) Find the difference in potential between the two ends of the resistor.

    (b) Find the power received by the resistor.

21. A 150 Ω resistor has a 30 V potential difference between its two ends.

    (a) Find the current flowing through this resistor.

    (b) Find the power delivered to this resistor.

22. A 100 W light bulb is left on for an entire week. How many kilowatthours of energy were delivered to this bulb over that week?

23. A 50 Ω resistor is in series with a 25 Ω resistor. [Sketch the schematic diagram.]

    (a) How does the current flowing through the 25 Ω resistor compare to that flowing through the 50 Ω resistor?

    (b) How does the potential difference between the ends of the 25 Ω resistor compare to that across the 50 Ω resistor?

24. A 1000 Ω resistor is in parallel with a 2000 Ω resistor. [Sketch the schematic diagram.]

    (a) How does the potential difference between the ends of the 1000 Ω resistor compare to that across the 2000 Ω resistor?

    (b) How does the current flowing through the 1000 Ω resistor compare to that flowing through the 2000 Ω resistor?