A-day: Due Thurs., Apr 10 (Assigned Tues., Apr 8)
B-day: Due Fri., Apr 11(Assigned Wed., Apr 9)

2008 Electricity 5

Equations	
In Series	$R_T = R_1 + R_2 \ldots$
In Parallel	$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots$

Example: 3 resistors are in parallel: 4Ω, 5Ω, and 7Ω. Find the total resistance of three resistors.

Solution: Since in parallel use:

$$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \ldots \qquad \frac{1}{R_T} = \frac{1}{4} + \frac{1}{5} + \frac{1}{7}$$

$$\frac{1}{R_T} = .25 + .2 + .143 \qquad \frac{1}{R_T} = .593$$

$$R_T = \frac{1}{.593} = 1.7\Omega$$

1. Series or parallel?

A. ___ Only one path for the electricity to flow.

B. ___ Paths are dependent on each other (*one affects the other*).

C. ___ How your house is wired.

D. ___ Paths are independent of each other.

E. ___ If one light turns off, the others stay on.

F. ___ If you turn off one light, all the lights turn off.

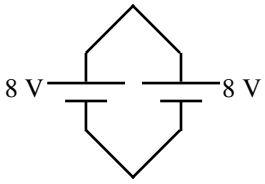
G. ___ Has more than one path for the electricity to flow.

H. ___ Two devices have the same current.

I. ___ Two devices have the same voltage.

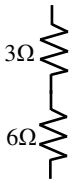
2. Decide if the following are in parallel or series and find the total voltage or total resistance.

A. Parallel or series?



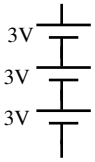
Vt = _____

B. Parallel or series?



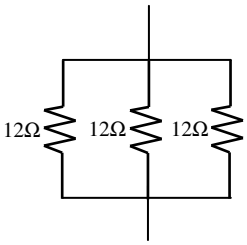
Vt = _____

C. Parallel or series?

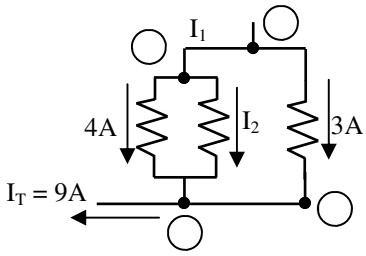


Vt = _____

D. Parallel or series?



Vt = _____



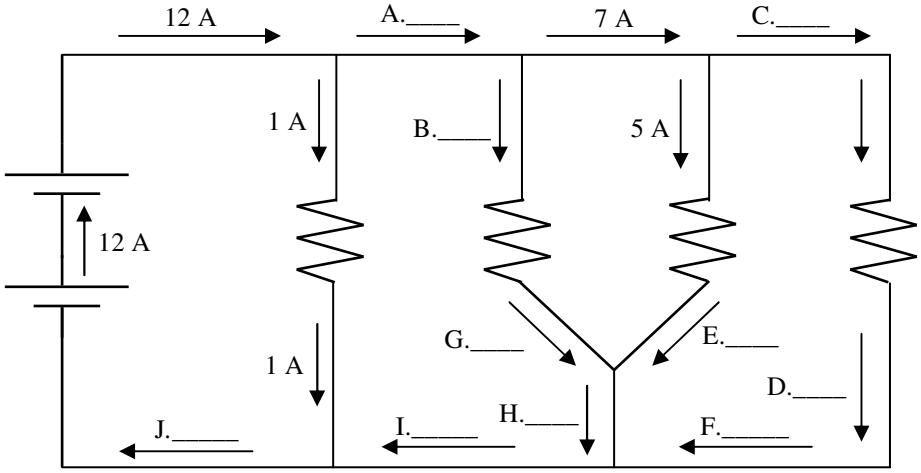
3. A. In each of the circles at the left, label them as S (split) or J (join).

B. Use the diagram, what is I_1 =

C. I_2 =

4. What do we call a place where electricity splits in a circuit?

5. Objects is series have the same _____. Objects in parallel have the same _____.

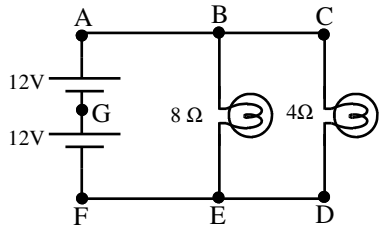


6. A. Fill in the blanks in the diagram. Big Hint: Fill them in in order.

B. What is the total current in the circuit?

C. If each battery is 3 v, what is the total voltage?

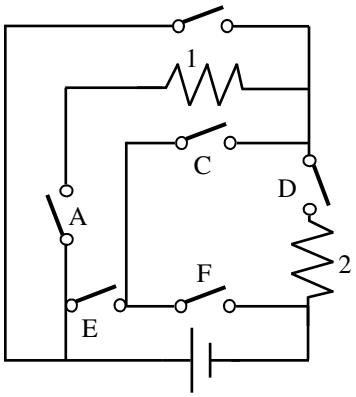
D. What is the total resistance of the circuit?



7. Use the diagram to answer:
   A) Total voltage: B) Parallel or series?
   C) Which light bulb will have more current flowing thru it?
   D) V at F? E) V at B =
   F) V from B to E (V_{BE}) =
   G) Find the current going thru the 8 Ω resistor.

   H) Find the current going thru the 4 Ω resistor.

   H) What is the I_T?



8. In the above diagram, which switches allow:
   A) only resistor 1 to have current in it?

   B) only resistor 2 to have current thru it?

   C) to by-pass both resistors?

   D) for electricity to go thru both resistors?

Seniors may stop.

9. Cows are _____ because they eat grass. Wolves are _____ because the eat rodents and deer. Bears and humans are _____ because we eat both plants and animals. Because plants make food and oxygen for animals, we call them _____. Animals are called _____ because the eat plants. Yet, when both plants and animals die they will be eaten by _____ like mushrooms and vultures.

10. Barnacles (a kind of small shell fish) live on the chin of whale. The whale has no benefit or harm, but the barnacles, being filter feeders, are helped because they have more water pass thru their bodies. This is an example of what kind of symbiosis?

11. A tree in Costa Rica has ants living in it. The ants eat the sap of the tree. When animals or birds touch the tree, the ants swarm out to attack, protecting the tree. This is an example of what kind of symbiosis?

12. Which of the badgers below are most closely related?
   A. North American Badgers – *Taxidea taxus*
   B. Palawan Badger – *Mydaus marchei*
   C. Eurasian Badgers – *Meles meles*
   C. Javan Stink Badger – *Mydaus javanensis*

13. Which are more closely related: organisms of the same family or same class?

14. Which cell organelle?
   A. Keeps poisons and other harmful materials from entering an animal cell.
   B. Produces energy for animal cells?
   C. Makes proteins to build and rebuild cells.
   D. Is where photosynthesis occurs?
   E. Is where the DNA remains.
   F. Is why celery is so hard to chew.

15. DNA remains always in the n_____ of the cell. In order for the cell to produce proteins the DNA information must moved to the r_____. Since DNA can't move outside the n_____, DNA is changed into mRNA by a process known as t_____. The mRNA is the m_____ RNA, taking the information to the r_____ where mRNA is made into _____ in a process known as t_____. Each three bases codes, known as a c_____, tells the r_____ what a_____ a_____ to make, eventually making proteins.