SCIENCE

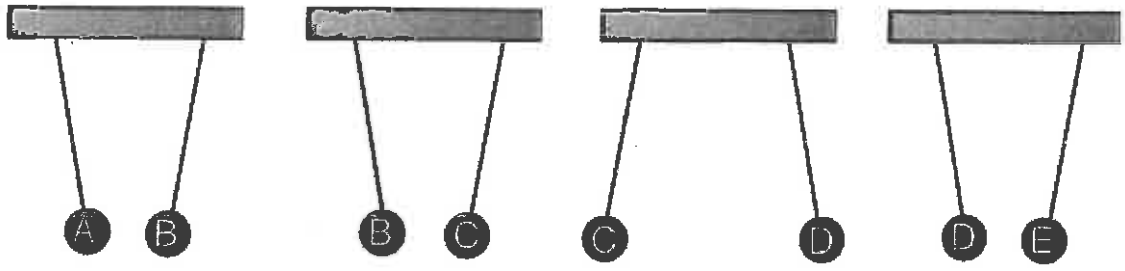
GRADE 10

MULTIPLE CHOICE

REVIEW

ELECTRICITY, MAGNETISM & ENERGY

1. Five metallic spheres were electrically charged and then suspended as shown in the diagram below:



If sphere A is positively charged, which of the spheres are negatively charged?

A) B and C

B) C and D

C) D and E

D) B & E

1. The list below arranges different substances in increasing order of their tendency to acquire electrons. When two of these substances are rubbed together, the one situated lower on the list attracts electrons from the substance above and becomes negatively charged.

Electrostatic Series Chart

Acetate	*Weak hold on electrons*
Glass	
Wool	
Cotton	
Ebonite	
Plastic	
Rubber	*Strong hold on electrons*

In the laboratory, a student rubs a cotton cloth with each of the following materials: ebonite, plastic, acetate and glass.

He then brings the different materials together:

1. Ebonite and plastic
2. Plastic and acetate
3. Acetate and glass
4. Glass and ebonite

In which of the situations do the materials repel each other?

A) 1 and 2

B) 1 and 3

C) 2 and 4

D) 3 and 4

3. Tom wants to prepare a surprise party for his baby sister. Amongst other things, he wants to decorate the walls of their house with multi-coloured balloons. Once the balloons are inflated, Tom rubs them on his hair for a few seconds and then sticks them to the wall. He knows that this is possible due to friction, as the balloons become electrically charged and are attracted to the wall.

Which of the following produced the static electricity?

A) The transfer of protons between the hair and the balloons.

B) The transfer of electrons between the hair and the balloons.

C) The transfer of electrons between the balloons and the wall.

D) The transfer of protons between the balloons and the wall.

4. Which of the statements below is TRUE?

A) Positively charged objects have a fewer protons than electrons.

B) Positively charged objects have more electrons than protons.

C) Negatively charged objects have more electrons than protons.

D) Negatively charged objects have more protons than electrons.

5. In an electrical circuit, the current intensity doubles. The total resistance of the circuit stays the same.

How does the potential difference change?

A) The potential difference halves.

B) The potential difference doubles.

C) The potential difference quadruples.

D) The potential difference stays the same.

6. What will happen to the current intensity in an electrical circuit if, for a given resistance, the potential difference is reduced by half?

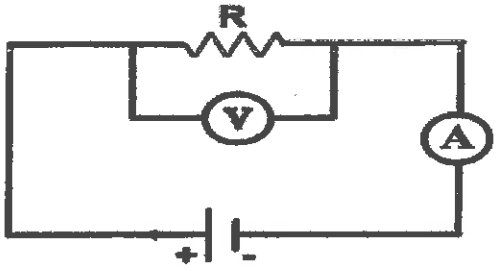
A) The current intensity will double.

B) The current intensity will not change.

C) The current intensity will reduce to half of the initial value.

D) The current intensity will quadruple.

7. In the circuit diagram below the reading on voltmeter is 12 V and the reading on the ammeter is 0.6 A.



What is the resistance of element R?

A) 0.05 Ω

B) 7 Ω

C) 10 Ω

D) 20 Ω

8. What is the potential difference of a circuit if the resistance is 25 Ω and the current intensity is 10 A?

A) 250 Ω

B) 0.40 V

C) 2.5 V

D) 250 V

9. A large flashlight that requires a 1.5 V battery. If the resistance of the light bulb is 3Ω, what is the current flowing through the light bulb?

A) 0.50 A

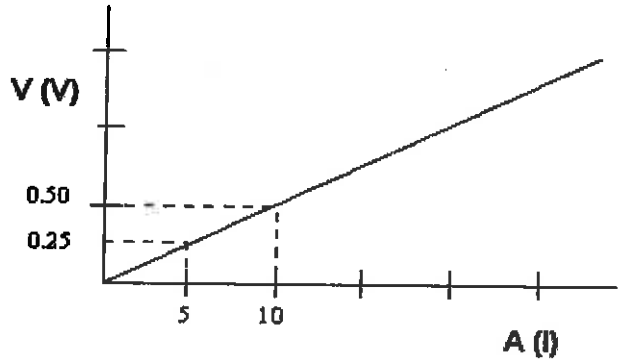
B) 1.5 A

C) 2.0 A

D) 4.5 A

10. The graph below shows the variation in the current intensity, *I*, as a function of the potential difference (voltage), *V*, across a resistor.

Relationship between Potential Difference and Current



What is the resistance, R, of the resistor?

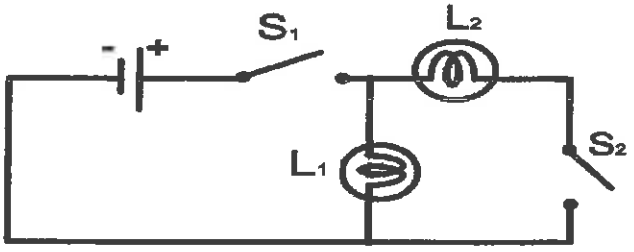
A) 0.05 Ω

B) 1 Ω

C) 5 Ω

D) 20 Ω

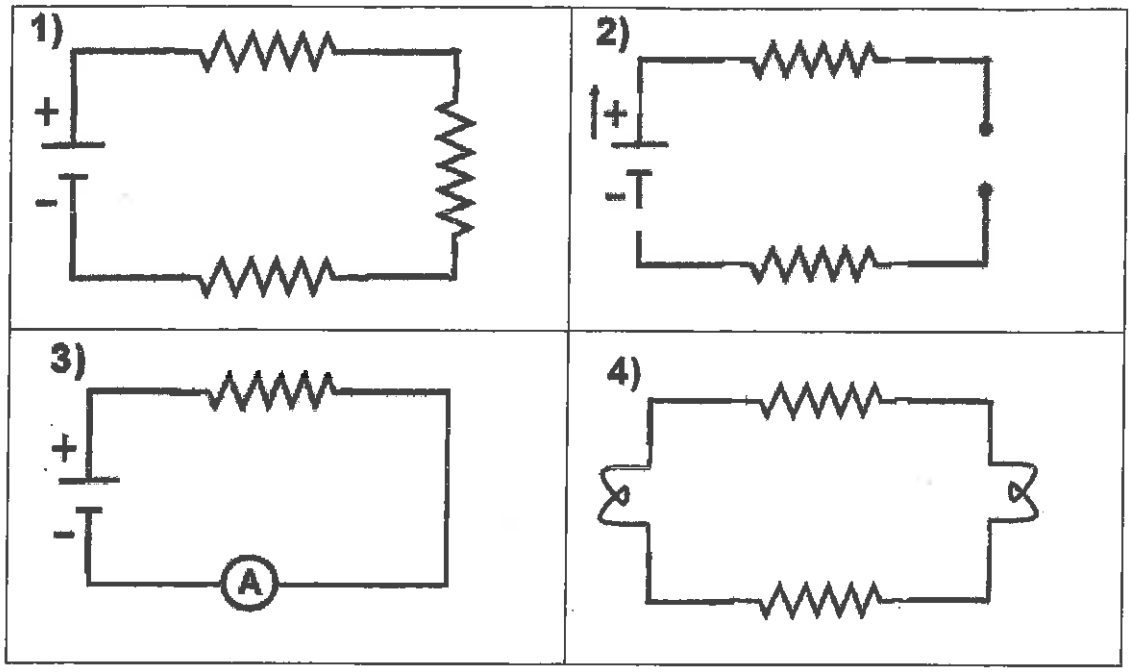
11. The diagram below shows a circuit made of two light bulbs, two switches and a power source.



Which of the following statements about this circuit is TRUE?

	S_1	S_2	L_1	L_2
A)	Opened	Closed	Off	On
B)	Closed	Opened	On	Off
C)	Opened	Closed	On	Off
D)	Closed	Opened	Off	On

12. In which of the following electrical circuits is electron flow *NOT* possible?



A) 1 and 2

B) 1 and 3

C) 2 and 3

D) 2 and 4

13. Which of the components depicted by the symbols below is used to STOP the electron flow in an electrical circuit?

A) 

B) 

C) 

D) 

14. Which of the following statements describe an alternating current (AC)?

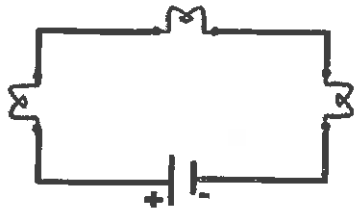
A) It is produced by a battery

B) Electrons change direction continuously.

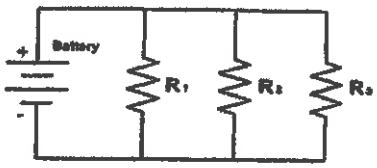
C) The electrons do not move.

D) Electrons move in the same direction.

1)



2) Which of the circuits are connected in parallel?



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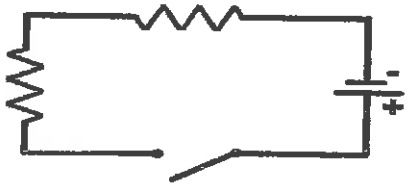

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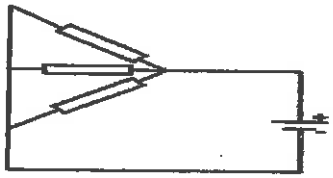


A) 1 and 4

B) 2 and 4

C) 1 and 3

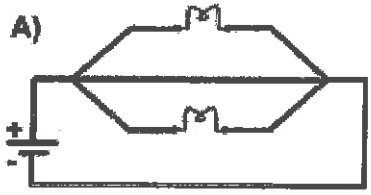
D) 2 and 3

3

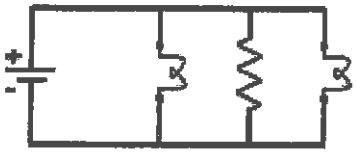
4. The figure below represents a simple electrical circuit containing a power source, two electrical bulbs and one resistor:

Which of the circuit diagrams below best represents this circuit?

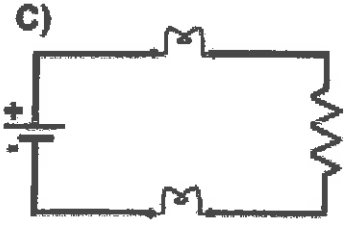
A)



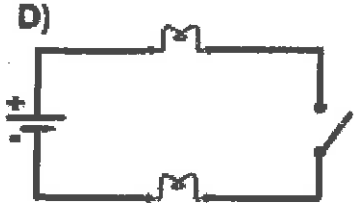
B)



C)



D)



B

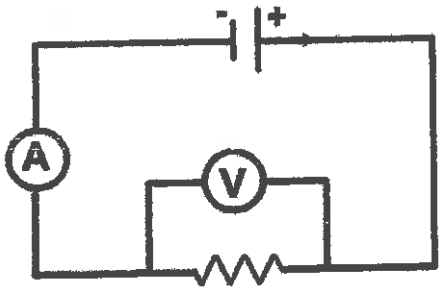
5. Which of the following would reduce the cost of using an electrical appliance?

1. Increase the operation time.
2. Use an appliance with a lower power rating.
3. Reduce the operation time.
4. Use an appliance with a higher power rating.

A) 1 and 3 B) 1 and 4 C) 2 and 3 D) 3 and 4

C

17. A student was asked to assemble a simple electrical circuit made of a resistor and a battery, an ammeter and a voltmeter. The diagram below represents the circuit that he assembled:



The ammeter reads is 0.80 A and the voltmeter reads 20 V.

What is the electrical power of this circuit?

A) 0.040 W

B) 16 W

C) 6 W

D) 25 W

18. What is the current drawn when a kettle with a power of 1.65 kW is connected to a 110V power supply?

A) 0.0150 A

B) 1.50 A

C) 15.0 A

D) 66.7 A

19. What is the voltage required by an electric grill with a power of 2.2 kW and current 20 A?

A) 0.11 V

B) 9.1 V

C) 26 V

D) 110 V

20. How much energy does an electric heater with a power of 200 W consume in 2.0 minutes?

A) 0.010 kJ

B) 24 kJ

C) 100 J

D) 400 J

How much energy is consumed by an oven with an electrical power of 4000 W in use for 2.5 hours?

A) 10 kWh

B) 10 000 kWh

C) 1600 kWh

D) 1.6 kWh

How long does it take for a kettle with a power of 2 000 W to use 30 000 J of energy?

A) 15 s

B) 15000 s

C) 15 min

D) 15 h

What is the power of an electric bulb that gives off 3600 J of energy in 10 minutes?

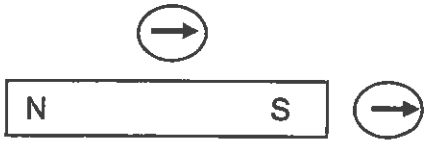
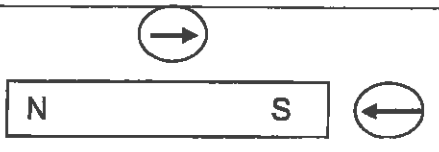
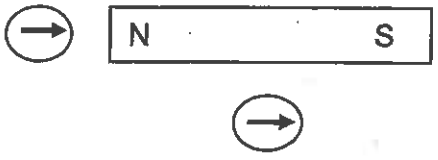
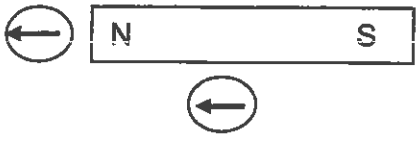
A) 6.0 kW

B) 2.8 kW

C) 6.0 W

D) 360 W

[illegible] correctly illustrates the behavior of a compass in the magnetic field of a bar magnet? WHICH IS CORRECT?

A)	
B)	
C)	
D)	

30 Joules of energy enter a light bulb. 20 joules of energy are transformed into light, how much energy is dissipated as heat?

A) 6.7 joules

B) 10 joules

C) 13 joules

D) 100 joules

A kettle consumes 15 500 J of energy to boil water. It is 85 % efficient. How much energy was used by the kettle to boil water?

A) 182 J

B) 13 175 J

C) 18 235 J

D) 1 317 500 J

An electrician installs patio lights in a back yard. Which of the following will increase the efficiency of the wiring system to the back yard?

1. Bury the extension cord deep underground.
2. Use a shorter extension cord.
3. Use a longer extension cord.
4. Use compact fluorescent patio lights

A) 1 and 2 B) 1 and 3 C) 2 and 4 D) 3 and 4