1. When a plastic rod is rubbed with fur, the plastic rod becomes negatively charged. Which statement explains the charge transfer between the plastic rod and the fur?

A Protons are transferred from the plastic rod to the fur.

B Protons are transferred from the fur to the plastic rod.

C Electrons are transferred from the plastic rod to the fur.

D Electrons are transferred from the fur to the plastic rod.

2. How do electrically charged objects affect neutral objects when they come in contact?

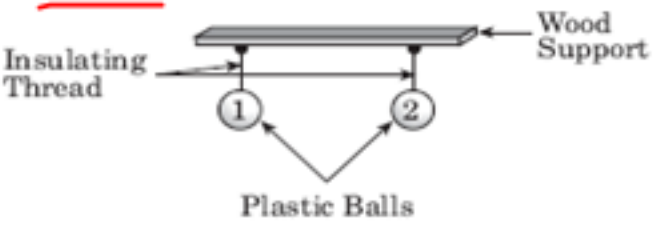
A Electrons move from negatively charged objects to neutral objects.

B Electrons move from neutral objects to negatively charged objects.

C Protons move from positively charged objects to neutral objects.

D Protons move from neutral objects to positively charged objects.

3. The drawing shows two uncharged lightweight plastic balls suspended by thin, insulating threads. Ball 1 is given a positive charge. Ball 2 is given an equivalent negative charge.



Which diagram ***best*** shows how the balls will react after becoming charged?

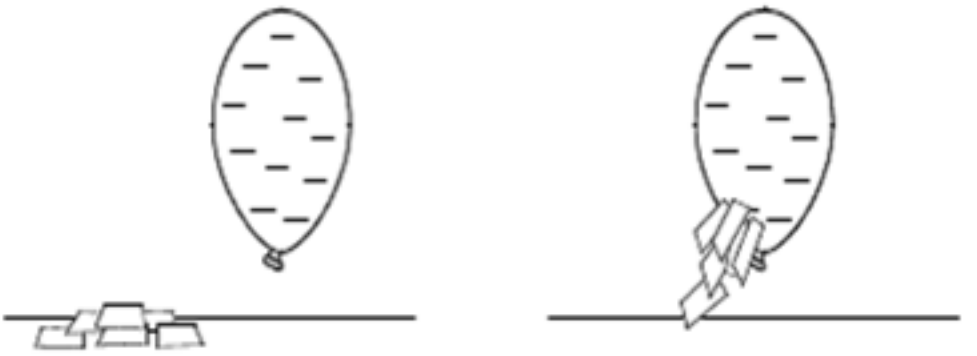
A

B

C

D

4. This diagram shows a negatively charged balloon. When the charged balloon is brought near some pieces of paper, the papers are attracted to the balloon.



Which describes the charging of the pieces of paper?

A positive, due to induction

B positive, due to conduction

C negative, due to induction

D negative, due to conduction

5. A series circuit has a 6-V battery and 3 ohms of resistance. How much current will flow through the circuit?

A 0.5 A

B 2 A

C 3 A

D 18 A

$V = 6\,V$

$R = 3\,\Omega$

$I =$

$V = IR$

$I = \frac{V}{R}$

$= \frac{6}{3}$

6. What voltage is required to run a 45-watt light bulb if the current is 0.5 amphere?

A 45 volts

B 90 volts

C 120 volts

D 225 volts

$V = ?$ $P = VI$

$P = 45W$ $V = \frac{P}{I}$

$I = .5A$ $= \frac{45}{.5}$

7. How much current is used by a 120-V refrigerator that uses 650 W of power?

P / V I

A 0.18 A

B 5.4 A

C 120 A

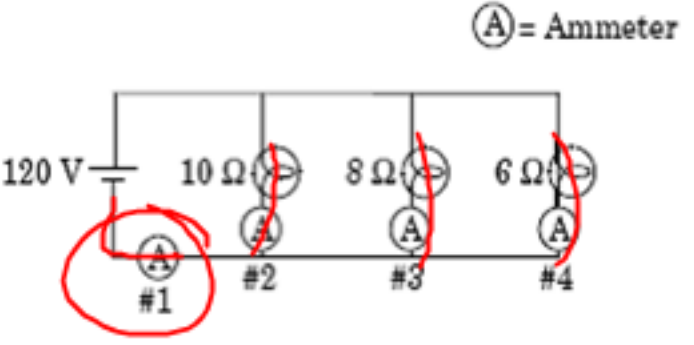
D 78,000 A

I =

V = 120 V

P = 650 W

8. Three light bulbs are connected to a 120-V potential difference. Ammeters are placed at four different locations labeled #1, #2, #3, and #4.



At which location will the current be greatest?

A #1

B #2

C #3

D #4

9. Which *best* describes a circuit in series?

A Different parts are on separate branches.

B Current values are different at various points in the circuit.

C Electrons may take several paths.

D Electrons have only one path at all times.

10. Which statement is true about parallel circuits?

A They contain separate branches through which current can flow.

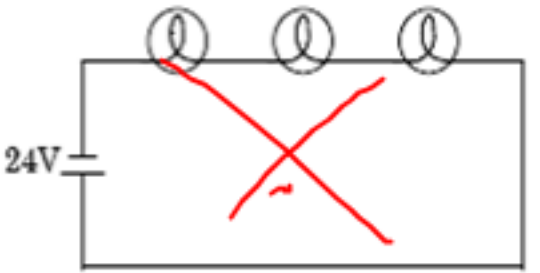
B They are usually called open circuits.

C They provide one path through which current can flow.

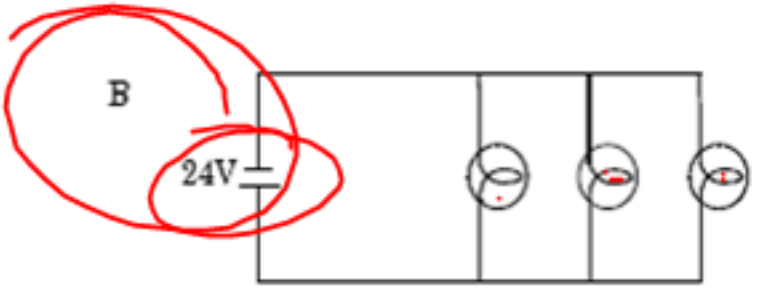
D They cease to function when one part of the circuit is disconnected.

11. Which is the correct diagram for a parallel circuit with three light bulbs powered by a 24-V battery?

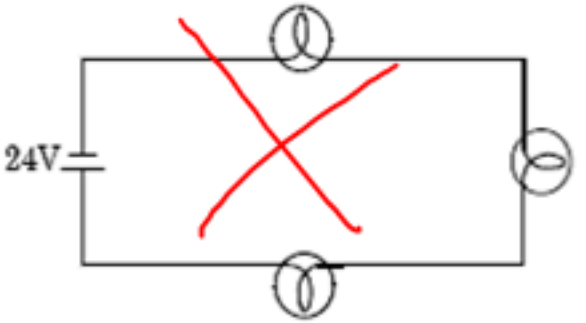
A



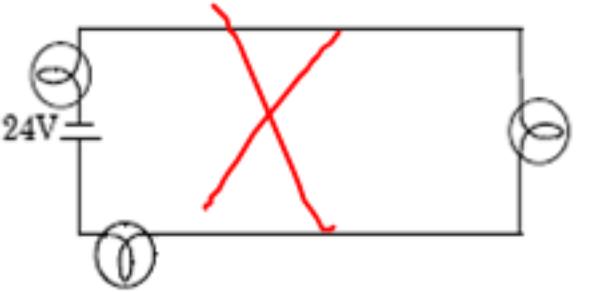
B



C



D



12. A motor has a current of 2 A flowing through it when it is powered with a 12-V battery. What is the power used by the motor?

A 0.16 W

B 6 W

C 14 W

D 24 W

$I = 2A$

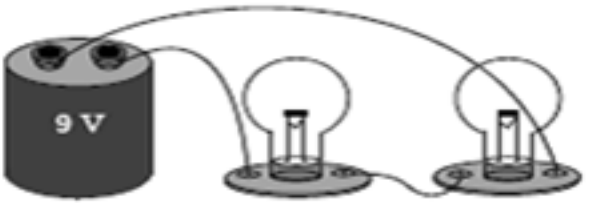
$V = 12V$

$P = ?$

$P = VI$

$= 12(2)$

13. The diagrams represent two complete circuits. A 9-V battery is connected to two light bulbs as shown.



Circuit A

Circuit B

Which statement *best* describes what can be observed?

A The light from Circuit A will be brighter because each light bulb adds its current to the other light bulb.

B The light from Circuit B will be brighter because each light bulb has a direct path to both poles of the battery.

C The light from Circuit A will be dimmer because each light bulb has a direct path to both poles of the battery.

D The light from Circuit B will be dimmer because each light bulb must share its current with the other light bulb.

14. A light bulb with a resistance of 100 ohms is plugged into a 120-volt outlet. What is the current flowing through the bulb?

A 0.83 ampere

B 1.2 amperes

C 20 amperes

D 220 amperes

$R = 100\ \Omega$

$V = 120\ V$

$I = ?$

$V = IR$

$I = \frac{V}{R}$ $\frac{120}{100}$

15. A sheet of paper is positioned to completely cover a bar magnet. Iron filings are then gently sprinkled on the paper. What does the pattern created by the iron filings indicate?

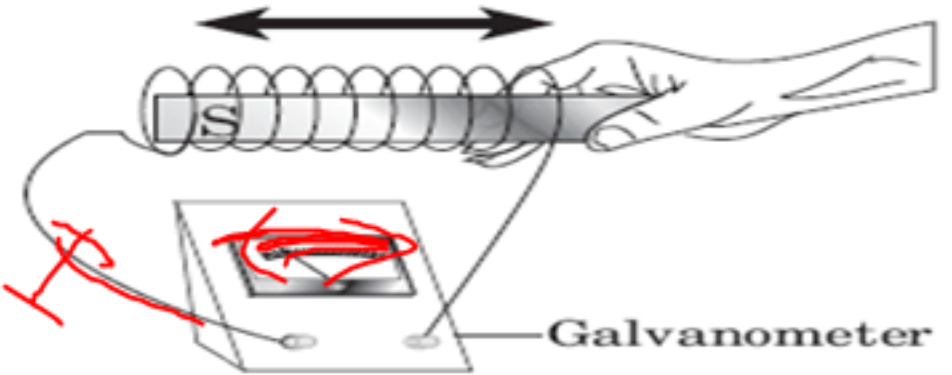
A the stronger of the two poles

B the distance between the two poles

C the midpoint of the area between the two poles

D the magnetic field created by the two poles

16. A magnet is moved back and forth through a loop of wire as shown below.



What will happen as the magnet is moved back and forth as shown?

A The wire will attract the magnet.

B The magnet will attract the wire.

C The galvanometer needle will stay at 0 on the scale.

D The galvanometer needle will move back and forth.

17. Which statement ***best*** describes a bar magnet that has been broken into two pieces?

A Both pieces have lost their magnetic poles.

B One piece has a north pole only, and the other piece has a south pole only.

C Each piece has both a north and a south pole.

D Both pieces have a north pole only.

18. A student coiled wire around a nail, attached both ends to a 1.5-V battery, and attempted to lift paper clips with the nail.

Results

Number of Turns of Wire	Paper Clips Picked Up
10	2
20	4
30	10
40	20

What is a valid conclusion for this investigation?

A Increasing voltage increases electromagnetic strength.

B Increasing the number of turns of wire decreases electromagnetic strength.

C Increasing the number of turns of wire increases electromagnetic strength.

D Increasing the number of turns of wire has no effect on electromagnetic strength.

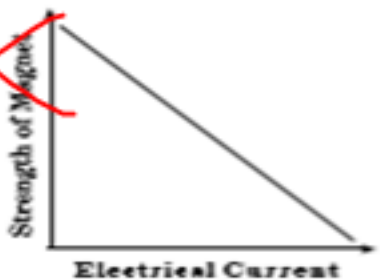
19. A student performed an experiment to determine the number of paper clips that are attracted to an electromagnet as the amount of current changes.

Data Table

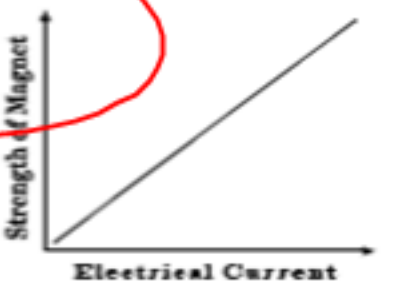
Current	Number of Paper Clips
5 A	20
10 A	40
15 A	60
20 A	80

Which graph best describes the relationship between magnetism and electrical current?

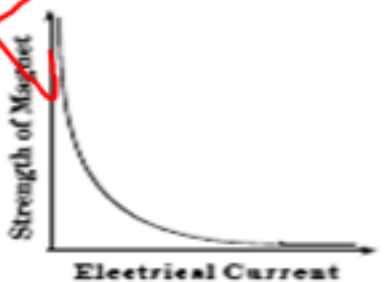
A



B



C



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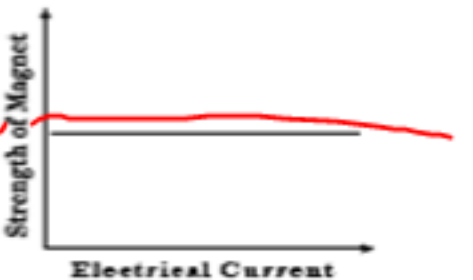

20. Which describes the magnetic fields of permanent magnets?

A domains aligned in different directions

B domains aligned in a similar direction

C electric current produced by the protons in each atom

D electric current produced by a battery or other outside source