

Static Electricity

Modified True/False

Indicate whether the statement is true or false. If false, change the identified word or phrase to make the statement true.

- _____ 1. The easiest way to neutralize a conductive material is to use a process called grounding.

- _____ 2. Friction can result in the transfer of protons from one object to another as the objects rub against each other.

- _____ 3. Static electricity describes an electric charge that is stationary on the surface of a material.

- _____ 4. Conductors allow electric charges to move easily through them. _____
- _____ 5. Like charges attract and opposite charges repel each other. _____,

- _____ 6. An object becomes charged if it contains unequal numbers of electrons and protons.

- _____ 7. You can ground a charged object by connecting it to Earth with a conductor. _____
- _____ 8. It is possible to charge an electroscope without touching it. _____
- _____ 9. Lightning is an extreme example of a static electric discharge. _____

Multiple Choice

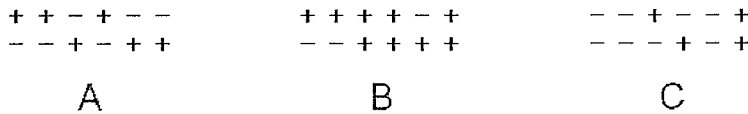
Identify the choice that best completes the statement or answers the question.

- _____ 10. When you rub different materials with wool or cotton and then hold the materials together, you can determine
- the properties of electric charges.
 - the speed of movement of electrons.
 - the sizes of electromagnetic fields.
 - which materials have a magnetic field.
- _____ 11. How will two acetate strips charged in the same way react to each other?
- They will attract one another.
 - They will repel one another.
 - They will not affect one another.
 - They will neutralize one another.

- _____ 12. When a charged acetate strip and a positively charged vinyl strip are brought together, they will
- attract one another.
 - repel one another.
 - not affect one another.
 - both become negatively charged.
- _____ 13. A plastic ball hanging by a string is attracted to a positively charged plastic rod. What can you conclude about the ball?
- It could be neutral or positively charged.
 - It is definitely positively charged.
 - It is definitely negatively charged.
 - It could be neutral or negatively charged.
- _____ 14. How does a positively charged object become neutralized?
- It loses protons.
 - It gains protons.
 - It gains electrons.
 - It loses electrons.
- _____ 15. When an uncharged object loses electrons, it becomes
- fully charged.
 - negatively charged.
 - neutral.
 - positively charged.
- _____ 16. What charge will a material take on if it gains electrons?
- a negative charge
 - no charge
 - a neutral charge
 - a positive charge
- _____ 17. Which of the following are among the laws of static electricity?
- Similar charges attract.
 - Similar charges repel.
 - Opposite charges attract.
 - Opposite charges repel.
 - Neutral objects are not attracted to charged objects.
 - Neutral objects are attracted to charged objects.
- I, IV, and VI
 - I, IV, and VI
 - II, III, and V
 - II, III, and VI
- _____ 18. Materials that do not allow a charge to move freely on or through them are called
- conductors.
 - unbalanced.
 - balanced.
 - insulators.
- _____ 19. Materials that allow charges to flow through them are called
- unbalanced.
 - conductors.
 - insulators.
 - balanced.
- _____ 20. Sometimes a material is charged by rubbing or touching and the charge remains stationary. This is an example of
- a balanced charge.
 - an unbalanced charge.
 - static electricity.
 - an insulator.

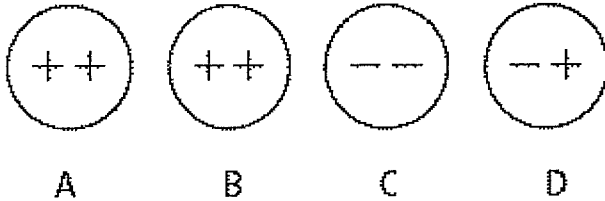
- ___ 21. According to the laws of charges, two objects that have opposite charges will
- attract one another.
 - repel one another.
 - ionize one another.
 - charge one another.

The following diagram illustrates the charge on three different objects, A, B, and C.



- ___ 22. In the illustration above, object A is
- positively charged.
 - negatively charged.
 - neutral.
 - a semiconductor.
- ___ 23. Based on the illustration above, if object C is brought close to object B,
- the objects will repel one another.
 - the objects will attract one another.
 - object C will be neutralized.
 - object A will be neutralized.
- ___ 24. In the illustration above, object B is
- uncharged.
 - positively charged.
 - an insulator.
 - negatively charged.
- ___ 25. If a material is to be classified as a good electrical conductor, it must
- hold its electrons tightly.
 - have no electrons.
 - hold its electrons loosely.
 - have electrons that are neutral.
- ___ 26. Which of the following most accurately explains the difference between an insulator and a conductor?
- A conductor traps and holds electrons more readily than an insulator.
 - Insulators do not allow charges to move freely through them, but conductors do.
 - Insulators are metals, while conductors are usually synthetic materials.
 - Rubbing a conductor with fur will cause it to stick to a wall, but rubbing an insulator with fur will not have any effect.
- ___ 27. Which of the following statements best describes the structure of an atom?
- a positively charged nucleus, consisting of protons and neutrons, orbited by electrons
 - electrons and protons within the nucleus, orbited by neutrons
 - a dense, positively charged nucleus, orbited by protons and electrons
 - negatively charged protons and neutrons in the nucleus, orbited by electrons

_____ 28. Consider the charges on the spheres shown. Which statement below is *not* accurate?



- a. Object A will attract object C.
 - b. Object B will repel object A and attract object C.
 - c. Object D will be attracted to object A only, and be repelled by the other objects.
 - d. Object B will attract object D.
- _____ 29. Why are wires usually constructed of metals?
- a. Metals are good conductors.
 - b. Metals are commonly found in long, thin forms.
 - c. Metals do *not* provide an easy path through which electrons can travel.
 - d. Metals have very few loosely held electrons.
- _____ 30. Many household electric plugs have two prongs. Some household appliances have plugs with three prongs. Which of the following statements best describes the function of this third, rounded prong?
- a. It allows electricity to flow into the appliance faster.
 - b. It keeps the plug attached to the wall better.
 - c. It allows the appliance to operate at a higher temperature.
 - d. It helps protect against electric shocks and fires by connecting to the grounding wire.

Completion

Complete each statement.

31. When electrons enter or leave an object to neutralize a charge, the result is a(n) _____.
32. A charged object is surrounded by a(n) _____ field.
33. A simple way to generate an electric charge in an object is to _____ the object.
34. The spark and shock you get from a door handle after you have scuffed your feet across the carpet is a small-scale version of _____.
35. Materials that do *not* allow electric charges to pass through them easily are known as _____; materials that *do* allow electric charges to pass easily are called _____.
36. The name of a device that detects electric charge is an _____.
37. A conductor or charged object connected to Earth is said to be _____.

Matching

Match each term to one of the following definitions.

- a. connecting an object to Earth with a conducting wire
- b. a charge produced by rubbing objects together
- c. material that offers little or no resistance to the flow of charges
- d. material through which a charge does not move
- e. material that holds its electrons loosely

- _____ 38. static electricity
- _____ 39. electrical insulator
- _____ 40. grounding

Match each term to one of the following definitions.

- a. unit of electric charge
- b. having an equal number of protons and electrons
- c. having no electrons
- d. a material that holds electrons loosely
- e. a rapid gain or loss of electrons
- f. pure water
- g. maker of the first "lightning" machine

- _____ 41. discharge
- _____ 42. neutral
- _____ 43. Van de Graff
- _____ 44. an electrical insulator

Match each term to one of the following definitions.

- a. electron
- b. proton
- c. neutron
- d. nucleus
- e. ion

- _____ 45. the part of an atom that is positively charged
- _____ 46. the part of an atom that is negatively charged
- _____ 47. the part of an atom that has no electric charge

Match each term to one of the following definitions.

- a. electrostatic spray painter
- b. lightning rod
- c. photocopier
- d. ionizer
- e. electroscope

- _____ 48. a conductor that protects buildings during storms
- _____ 49. a device that uses electric charge to remove pollutants from smokestacks
- _____ 50. a device that is used to observe the presence of electric charge

