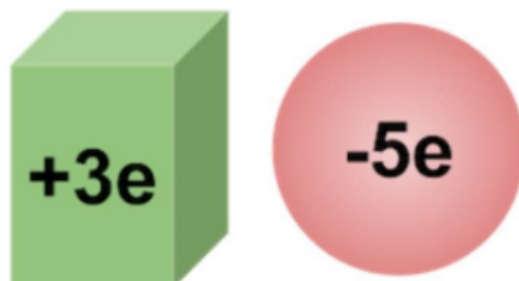


AP Physics 1 – Algebra-Based: Unit 8 Electric Charge and Electric Force Practice Test

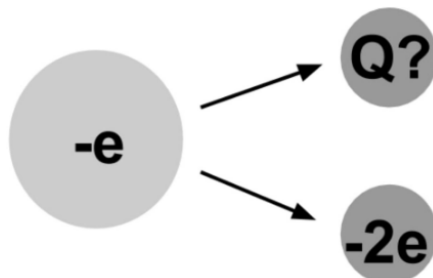
Question 1:



A metal block with a charge $Q_1 = +3e$ sits near a metal ball that has a charge $Q_2 = -5e$. If the block is touched to the ball, what is a possible final charge on each object?

- A. $Q_1 = +1e, Q_2 = +1e$
- B. $Q_1 = -1e, Q_2 = -1e$
- C. $Q_1 = 0, Q_2 = -2e$
- D. $Q_1 = +4e, Q_2 = -4e$

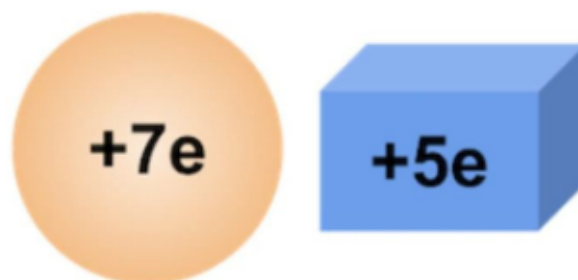
Question 2:



The researcher is analyzing a particle decay process. The data for one experiment shows a particle of charge $-e$ decaying to form two new particles. One of the new particles has a charge of $-2e$. What is the charge of the other particle, Q ?

- A. $+1e$
- B. $+3e$
- C. $-1e$
- D. $+2e$

Question 3:



A metal sphere with a charge $Q_1 = +7e$ sits near a metal block that has a charge $Q_2 = +5e$. If the sphere is touched to the block, what is a possible final charge on each object?

- A. $Q_1 = 0, Q_2 = +12e$
- B. $Q_1 = +5e, Q_2 = +3e$
- C. $Q_1 = +8e, Q_2 = +4e$
- D. $Q_1 = -7e, Q_2 = -5e$

Question 4:

When two electric charges are held a distance r apart, the electrostatic force between them is F_E . The distance between the charges is then changed to $\frac{1}{2}r$. What is the new electrostatic force between the charges?

- A. $\frac{1}{4}F_E$
- B. $4F_E$
- C. $2F_E$
- D. $\frac{1}{2}F_E$

Question 5:

When two electric charges, q_1 and q_2 are held a distance apart, the electrostatic force between them is F_E . The charge of q_1 is then doubled and the charge of q_2 is tripled. What is the new electrostatic force between the charges?

- A. $6F_E$

- B. $\frac{1}{6}F_E$
- C. $36F_E$
- D. $5F_E$

Question 6:

An object becomes positively charged when which of the following occurs?

- A. loses electrons
- B. gains electrons
- C. loses protons
- D. gains neutrons

Question 7:

Lightning is _____.

- A. a buildup of neutrons
- B. harmless
- C. a high-voltage electric current
- D. a large discharge of static electricity

Question 8:

The mathematical relationship between Voltage, Current, and Resistance:

- A. Faraday's Law
- B. Tesla's Law
- C. Edison's Law
- D. Ohm's Law

Question 9:

If two charges have an electric force F between them and one of the charges is doubled, the force will be:

- A. halved
- B. doubled
- C. the same
- D. quadrupled

Question 10:

Two electrons are 1 nm apart. Estimate and compare the gravitational force between the electrons to the electric force between the electrons.

- A. The gravitational force is much stronger.
- B. The electric force is much stronger.
- C. The forces are about the same magnitude.
- D. There is no gravitational force between them.

Question 11:

If a substance has a higher number of electrons than protons on its surface, what type of charge does it have?

- A. A positive charge.
- B. A neutral charge.
- C. A negative charge.
- D. No charge at all.

Question 12:

Which subatomic particles contribute the most to the mass of an atom?

- A. Protons, neutrons, electrons
- B. Protons and electrons
- C. Protons only
- D. Protons and neutrons

Question 13:

If two balloons have the same charge, what will happen if you place them close to each other?

- A. nothing
- B. they will pop
- C. they will be attracted
- D. they will push each other away

Question 14:

Which of the following statements is incorrect?

- A. Two objects with the same type of charge repel each other.

- B. Two objects with opposite types of charge attract each other.
- C. Two objects made of different materials rubbed against each other acquire the same type of charge.
- D. All of these are correct.

Question 15:

When uncharged bits of paper are brought near a charged comb:

- A. There is attraction because the paper is a dielectric.
- B. There is no interaction because the paper is not charged.
- C. There is no interaction because the paper is too heavy to move.
- D. There is repulsion because the paper is a dielectric.

Question 16:

When a glass rod is rubbed with silk, it...

- A. gains electrons from silk
- B. gives electrons to silk
- C. gains protons from silk
- D. gives protons to silk

Question 17:

What is a static charge?

- A. an electric charge that is unchanging
- B. an unbalanced charge on an object
- C. an electric charge that is fluctuating
- D. a balanced charge on an object

Question 18:

An object with a negative charge will be most strongly attracted to which of the following?

- A. an object with a weak positive charge
- B. an object with a weak negative charge
- C. an object with a strong negative charge
- D. an object with a strong positive charge

Question 19:

What is it called when an object gains a charge, touched by another charged object?

- A. induction
- B. convection
- C. conduction
- D. radiation

Answer Key:

1. B
2. A
3. C
4. B
5. A
6. A
7. D
8. D
9. B
10. B
11. C
12. D
13. D
14. C
15. A
16. B
17. B
18. D
19. C