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QUESTION 1

Suppose that a positively charged piece of tape has a charge of 2.00×10^{-2} C and an excess of 1.25×10^{17} protons. Which of the equations below is part of the solution used to calculate the elementary charge?

- ◉ $e = \frac{q}{N_p - N_e} = \frac{2.00 \times 10^{-2}\ \text{C}}{1.25 \times 10^{17}}$ ✓
- ○ $e = \frac{q}{N_p - N_e} = \frac{2.00 \times 10^{-2}\ \text{C}}{8.00 \times 10^{-18}}$
- ○ $e = \frac{q}{N_p - N_e} = \frac{1.25 \times 10^{17}}{2.00 \times 10^{-2}\ \text{C}}$
- ○ $e = \frac{N_p - N_e}{q} = \frac{1.25 \times 10^{17}}{2.00 \times 10^{-2}\ \text{C}}$

QUESTION 2

Select the best choices.

An object has 12 protons and an unknown number of electrons. Khaled found that its net charge is

6.408×10^{-19} C

. Find the type of charge of this object and calculate the unknown number of electrons.

- [ ] negatively charged
- [x] 2 electrons
- [ ] 3 electrons
- [x] 8 electrons ✓
- [x] positively charged ✓
- [ ] 5 electrons

QUESTION 3

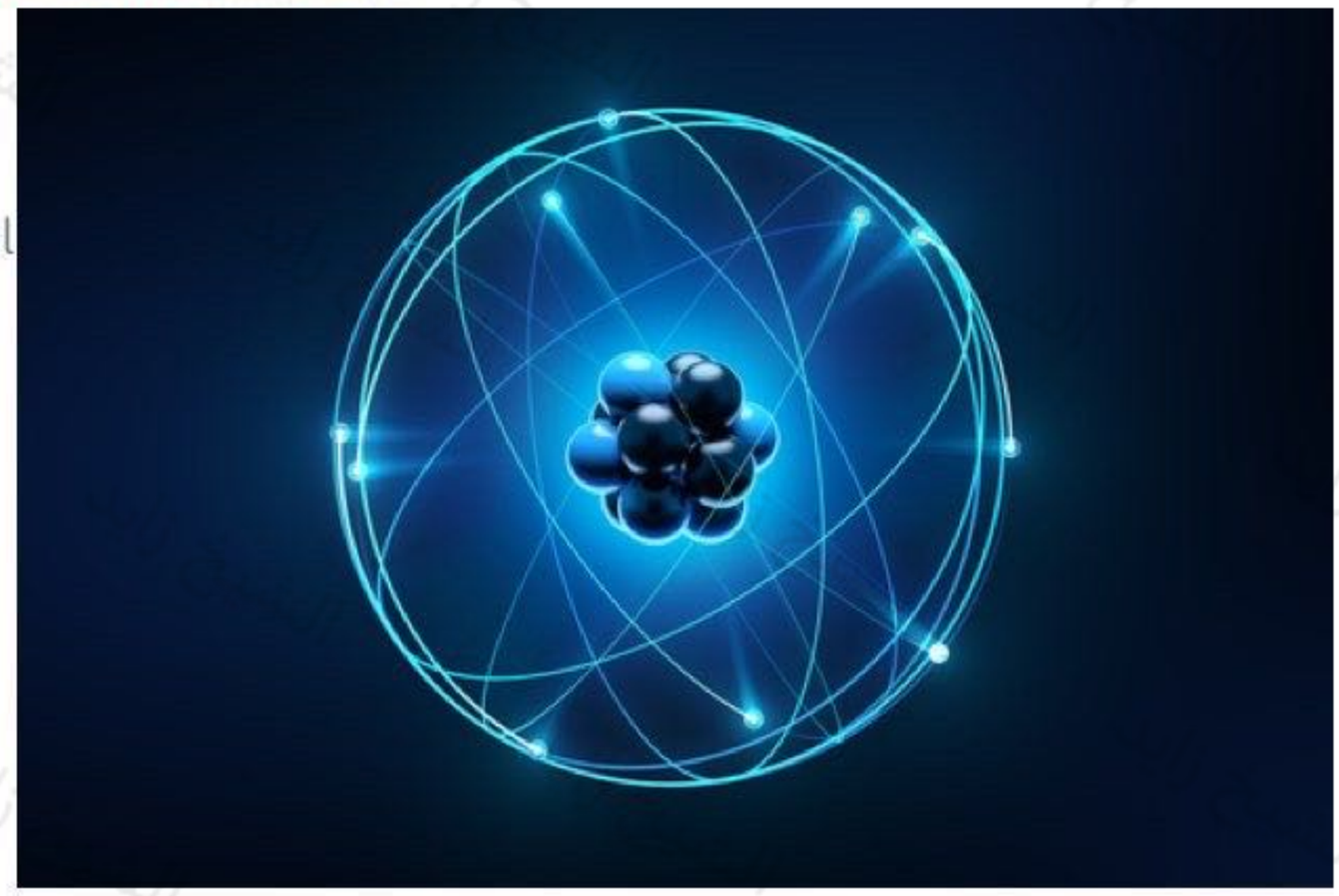
Select the best answers from the drop-down menus to complete the sentence.

The charge of an object is measured in coulombs ✓, where 1 C= 1 A s ✓.

QUESTION 4

Drag and drop the best answer to complete the sentence below.

Electrons and protons have the least amount of charge possible, which is called elementary charge ✓, and it is equal to 1.602×10^{-19} C ✓.



1.602×10^{19} C

1.602×10^{-19} m

negative charge

positive charge

QUESTION 5

Select from the drop-down menu the best answer to complete the sentence.

When an object is neutral ✓, its number of electrons is equal to the number of protons. For example, it may have 22 electrons and 22 ✓ protons.

QUESTION 6

Select the correct choices about electric charges.

- ☐ $q_e = q_p$
- ☐ $q_e = -2q_p$
- ☑ $q_e = -q_p$ ✓
- ☐ $q_e = 1.602 \times 10^{-19}\ \text{C}$
- ☐ A positively charged object may have a charge of $+5.5e$.
- ☑ A positively charged object may have a charge of $+5e$. ✓

QUESTION 7

Select the correct answer.

The ion

Mg^{2+}

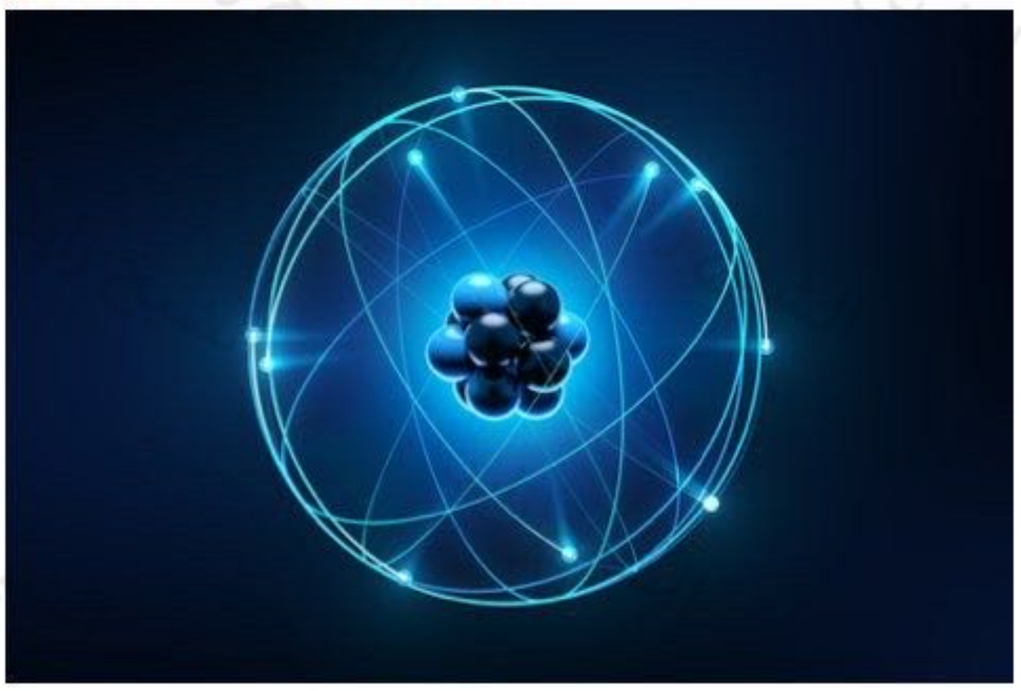
is used in many applications. Which of the following choices best describes the charge of this ion?

- ○ $q_{net} \leq 0$
- ○ $q_{net} = 0$
- ◉ $q_{net} > 0$ ✓
- ○ $q_{net} < 0$

QUESTION 8

Select from the drop-down menu the best answers to complete the statement below.

Electrons and protons are found inside an atom. The nucleus is [positively charged ✓] because it contains [protons ✓].



QUESTION 9

Select the correct answer.

An object has

1.78×10^{14} protons

and

1.78×10^{14} electrons

. What is the net charge of this object?

- (●) $q_{net} = 0$ ✓
- ( ) $q_{net} \leq 0$
- ( ) $q_{net} > 0$
- ( ) $q_{net} < 0$

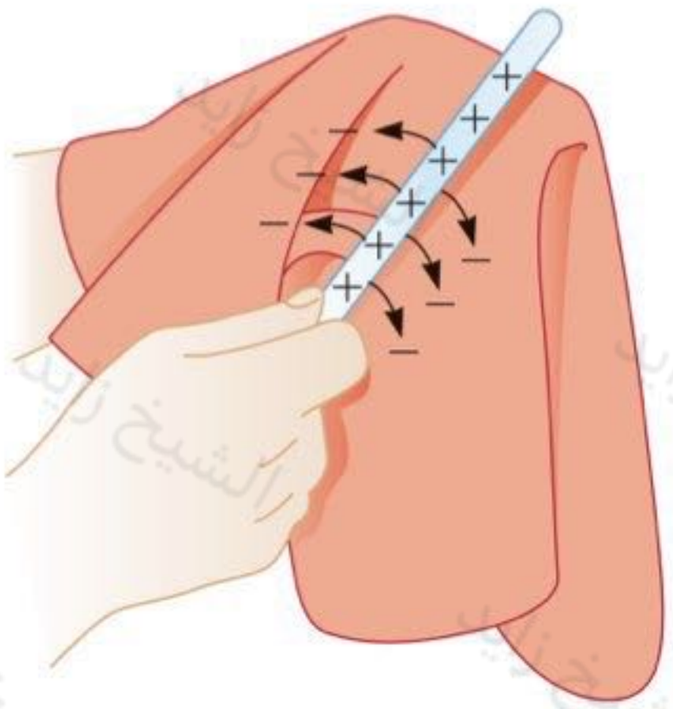
QUESTION 10

Select the correct choices.

After rubbing a glass rod with silk, the glass rod has a net charge of

$+2.30 \times 10^{-2}$ C

. Select the best choices about this rod.



- This object has an excess of

- [ ] 1.43×10^{17} electrons.

- [x] Some electrons are transferred from this object. ✓

- [x] This object is deficient of 1.43×10^{17} electrons. ✓

- [ ] Some electrons are transferred to this object.

- [ ] Some protons are transferred to this object.

- [ ] This object has an excess of 1.43×10^{17} neutrons.

QUESTION 11

Select the correct answer.

One coulomb is equal to one ampere multiplied by a second. Based on this, which of the following formulas can be used to find the electric current passing through a wire?

SI System

Coulomb = Ampere × Second

- $I = q - \Delta t$
- $I = q + \Delta t$
- $I = q \times \Delta t$
- $I = \frac{q}{\Delta t}$ ✓

QUESTION 12

Select the correct answer.

A balloon is rubbed on Sultan's hair to make it negatively charged. If the number of protons on the balloon is

2.0×10^{17}

, and the number of electrons on the balloon is

3.4×10^{17}

, what is the net charge of the balloon?



- ○ -4.5×10^{-2} C
- ◉ -2.2×10^{-2} C ✓
- ○ $+4.5 \times 10^{-2}$ C
- ○ $+2.2 \times 10^{-2}$ C

QUESTION 13

Select the correct answers.

Which of the following statements are true?

- ☐ Protons have a charge of $0\ e$.

☐ In a helium atom, the two protons inside the nucleus exert an attractive electrostatic force on each other.

☐ In a helium atom, the two protons inside the nucleus do not exert any electrostatic force on each other.

☐ Protons have a charge of $-1\,e$.

☑ Protons have a charge of $+1\,e$. ✓

☑ In a helium atom, the two protons inside the nucleus exert a repulsive electrostatic force on each other. ✓

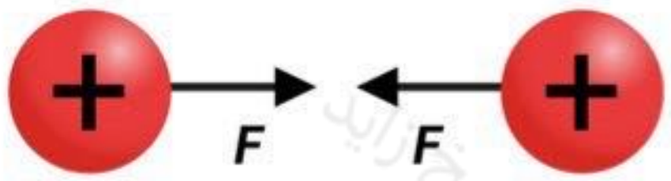
QUESTION 14

Select the correct answer.

Two positive charges are placed beside each other as shown in the image on the right. Which of the following choices best shows the direction of the electric force exerted on each other?




F
F


F
F


F
F


F
F

QUESTION 15

Select the correct answer.

Khalifa rubbed a glass rod with a piece of cloth. Which of the following statements is true about the final situation of the glass rod and the piece of cloth?



- The glass rod and the piece of cloth will both stay neutral.
- Only the piece of cloth will be charged.
- Only the glass rod will be charged.
- **The glass rod and the piece of cloth will both become charged.** ✓