

Electrostatics: Exam Revision Tracker



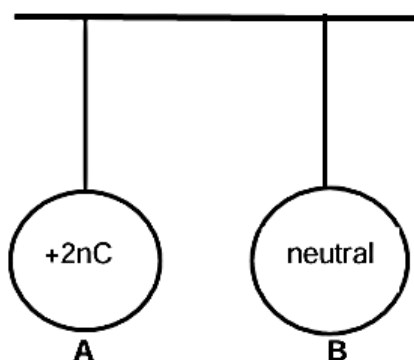
Attempt #1		Attempt #2		Attempt #3		Attempt #4		Attempt #5	
Total	Score	Total	Score	Total	Score	Total	Score	Total	Score
10		7		8		13		10	
Percentage =		Percentage =		Percentage =		Percentage =		Percentage =	

Electrostatics: Attempt #1



Total = 10 Marks

Two identical insulated spheres, **A** and **B**, suspended by a light inextensible string from a ceiling, are held a distance apart, as shown below.



Sphere **A** carries a charge of $+2nC$, while sphere **B** is neutral.

1. Explain what is meant by *neutral charge*. (2)

Sphere **A** is brought near the neutral sphere **B** and the spheres are allowed to touch each other. Immediately after touching, sphere **B** moves away from sphere **A**. Sphere **B** now has an excess of 20 electrons.

2. State the *principle of conservation of charge* in words. (2)
3. Briefly explain how the neutral sphere **B** is attracted to sphere **A**. (2)
4. Calculate the magnitude of the charge of sphere **B**. (3)
5. Calculate the charge on each sphere after they have separated. (3)

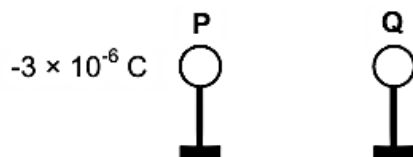
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Electrostatics: Attempt #2 ⚡

Total = 7 Marks

The diagram below shows two small identical spheres, **P** and **Q**, on insulated stands. The charge on sphere **P** is $-3 \times 10^{-6} \text{ C}$ and the charge on sphere **Q** is unknown.



1. Calculate the number of electrons in excess on sphere **P**. (3)

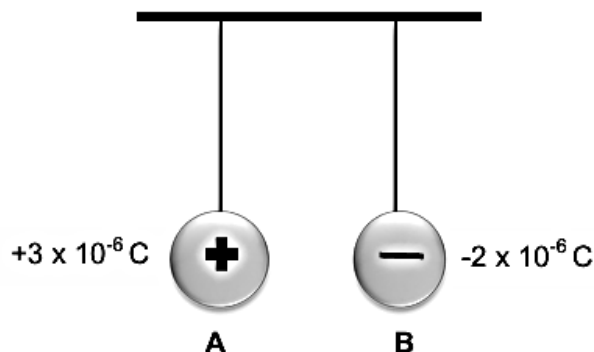
The two spheres are brought into contact and are then returned to their original positions. Each sphere now carries a charge of $-1 \times 10^{-6} \text{ C}$.

2. Calculate the original charge on sphere **Q** before the spheres were brought into contact. (3)
3. Were electrons transferred from **P** TO **Q** or from **Q** TO **P** during contact? (1)

Electrostatics: Attempt #3 ⚡

Total = 8 Marks

Two small identical spheres, **A** and **B**, are suspended on long silk threads, as shown in the sketch below. The spheres carry charges of $+3 \times 10^{-6} \text{ C}$ and $-2 \times 10^{-6} \text{ C}$ respectively.



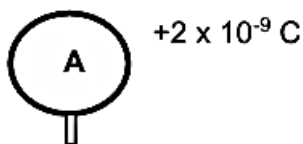
1. Which sphere has an excess of electrons? (1)
2. The two spheres are allowed to touch. Will the electrons be transferred from **A** to **B** or **B** to **A**? (1)
3. The spheres are now separated.
Calculate the new charge on sphere **B**. (3)
4. Calculate the number of electrons transferred during contact. (3)

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Electrostatics: Attempt #4 ⚡

Total = 13 Marks

1. A small, metal sphere **A** carrying a charge of $+2 \times 10^{-9} \text{ C}$ is placed on an insulated stand.



- 1.1 How does the number of electrons compare with the number of protons in sphere **A**?

Choose from LESS THAN, GREATER THAN or EQUAL TO. (1)

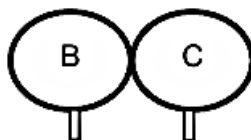
10^{13} electrons are now added to sphere A

- 1.2 Calculate the new charge on sphere **A**. (4)

2. Two identical metal spheres **B** and **C** placed on insulated stands, carry charges $+4 \times 10^{-6} \text{ C}$ and $-6 \times 10^{-6} \text{ C}$ respectively as shown in the diagram below.



The spheres are allowed to touch each other.



After touching the spheres are then separated and brought back to their original positions as shown in the diagram below.



- 2.1 State the principle of conservation of charge. (2)
- 2.2 Calculate the number of electrons transferred between the two spheres during contact. (6)

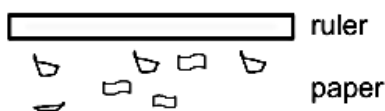


Electrostatics: Attempt #5 ⚡

Total = 10 Marks

A neutral plastic ruler becomes charged when it is rubbed with a woollen cloth. After rubbing, the ruler has a charge of $-3,5 \times 10^{-15} \text{ C}$.

1. Distinguish between a *neutral object* and a *charged object*. (2)
2. Does the ruler GAIN or LOSE electrons? (1)
3. Calculate the number of electrons transferred during the process of rubbing. (3)
4. The charged ruler is now brought closer to pieces of paper. The pieces of paper are attracted to the ruler, as shown below.



- 4.1 Explain why the pieces of paper are attracted to the ruler. (3)
- 4.2 Name ONE application of electrostatics in our daily lives. (1)

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