Solution 5.1

Year11

Answer 1

(3 marks)

(a) Will the spheres attract or repel each other? Circle the correct response: (1 mark)

Attract Repel

Description	Marks
Attract	1
Total	**1**

(b) (i) The student touched the spheres together, and they then moved apart. Determine the overall charge, in coulombs, on the pair of spheres after they were touched together. (1 mark)

Description	Marks
-3.0 mC + 6.0 mC = +3.0 mC	1
Total	**1**

(ii) Determine the charge on each sphere after they had separated. (1 mark)

Description	Marks
Charge is shared between each sphere so A = B = +1.5 mC Positive sign not required for full marks.	1
Total	**1**

Answer 2

(4 marks)

E, F, G and H are very small glass balls. F, G and H are charged, but it is not known what type of charge they possess. In order to test the types of charge on these balls, we charge glass ball E by rubbing it with silk. This removes electrons from the glass ball.

(a) Once E has been charged, we find E attracts F and F repels G, but G attracts H. Which are two negatively charged balls? (1 mark)

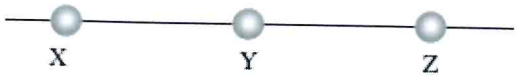
A E and F
B F and H
C E and G
D F and G

Correct answer: D

Solution 5·1
Answer 2 continued

Year 11

Three balls are selected from these four balls and renamed 'X', 'Y' and 'Z'. These three balls are placed in a straight line with a reasonable distance between them. Balls X and Z are fixed in place and Y is kept in equilibrium through electrostatic forces as shown below.



(b) For Y to stay in a stable position, the charges on the spheres need to be (1 mark)

A X is positive, Y is positive and Z is negative.
B X is positive, Y is negative and Z is positive.
C X is negative, Y is positive and Z is positive.
D X is negative, Y is negative and Z is positive.

Correct answer: B

(c) An atom has two electrons removed from it. Which statement is correct? (2 marks)

A The atom becomes a different isotope.
B The atom becomes more positive.
C The atom becomes more negative.
D The atom is unchanged.

Correct answer: B

Explain your choice.

Description	Marks
(a) D	1
(b) B	1
(c) B	1
By removing negative charges, there are more positives charges, making the atom more positive. ('Electrons are lost or transferred' is acceptable.)	1
	Total 4