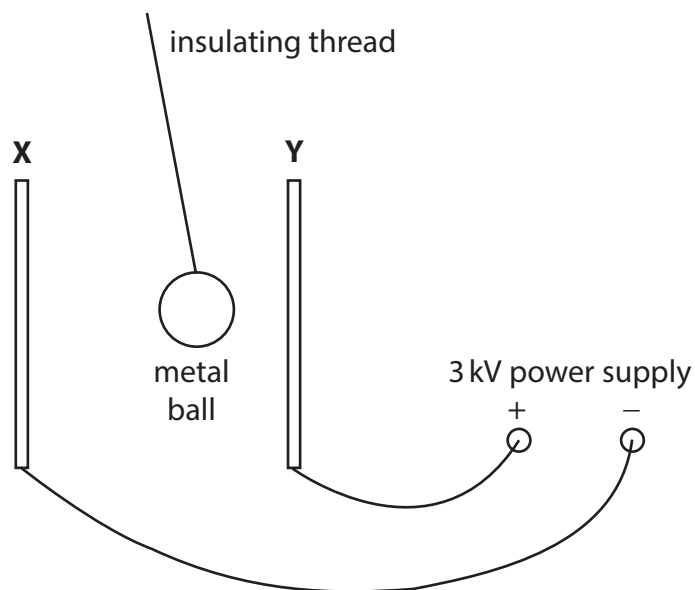


- 2 This question is about a demonstration to show the link between current and charge.
- The diagram shows two metal plates, X and Y, with a metal ball moving between them.



- (a) The two metal plates have no charge before the power supply is connected.

When plate Y is connected to the positive terminal of the power supply, the plate becomes positively charged.

Explain how plate Y gains a positive charge.

(2)

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- (b) (i) The metal ball becomes positively charged when it touches plate Y.

The metal ball then moves away from plate Y towards plate X.

Explain why the metal ball moves away from plate Y.

(2)

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(ii) Give a reason why the ball is made of metal.

(1)

(c) When the metal ball moves away from plate Y to plate X, a charge of  $5.1 \times 10^{-6} \text{ C}$  is transferred.

(i) State the formula linking charge transferred, current and time taken.

(1)

(ii) Calculate the current if the metal ball takes 0.45 seconds to travel from plate Y to plate X.

(2)

current = ..... A

(iii) Suggest why the current increases if the voltage of the power supply is increased.

(1)

(iv) Give the name of the apparatus that can be used to measure current.

(1)

(Total for Question 2 = 10 marks)

