3.5 Electricity: 10-minute Pack

AQA 7408 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A student uses a data logger to measure the charge that flows through a filament lamp over a short period of time after it is switched on.

(a) State what is meant by electric current. **(1)**

(b) A charge of 480 C flows through the lamp in 4.0 minutes. Calculate the current in the lamp. Use Q = I t. **(3)**

(c) The charge on one electron is 1.60×10^{-19} C. Calculate the number of electrons that pass a point in the filament each second. **(3)**

(Total for Question 1 is 7 marks)

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Mark scheme · 3.5 Electricity: 10-minute Pack

Question 1

(a) the rate of flow of (positive) charge, oe **B1**

(a) Answer: Current is the rate of flow of charge.

(b) convert time to seconds: 4.0 min = 240 s **B1**

(b) correct rearrangement I = Q/t and substitution **M1**

(b) I = 2.0 A, cao **A1**

(b) Answer: 2.0 A

(c) recognise that the number per second n = I / e, oe, ft from (b) **M1**

(c) correct substitution: n = 2.0 / (1.60 x 10^{-19}) **M1**

(c) 1.25 x 10^{19} electrons per second, awrt, cao **A1**

(c) Answer: 1.25 x 10^{19} electrons per second

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