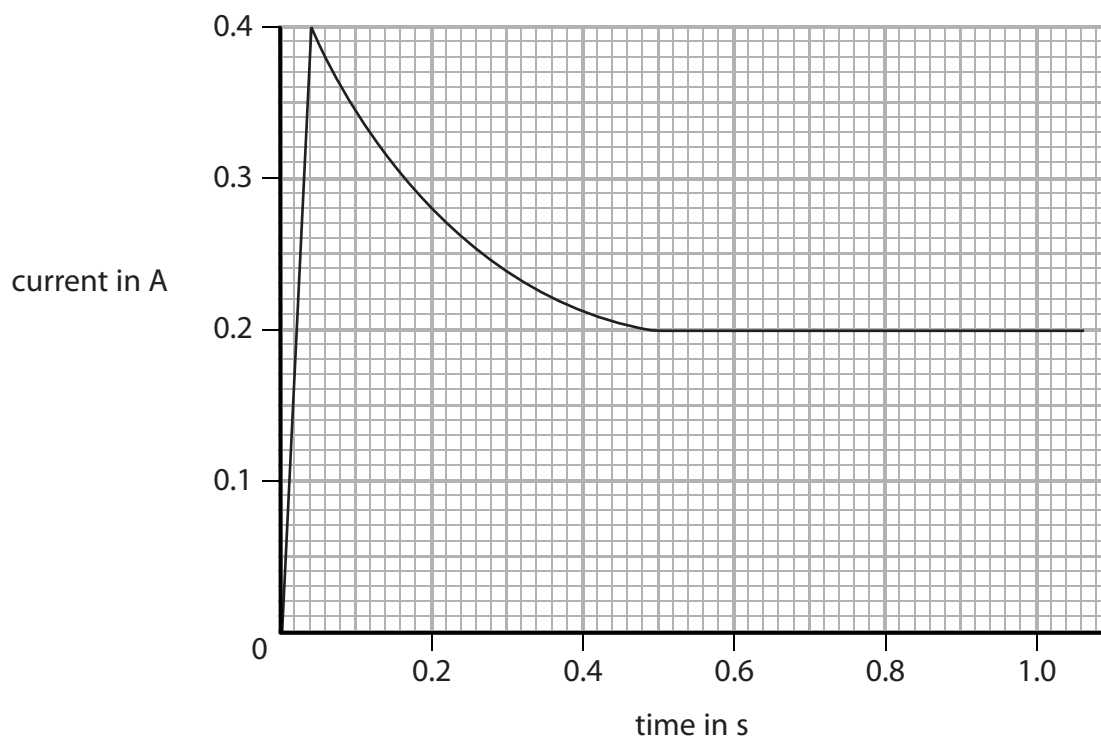


7 A filament lamp is connected to a battery.

The lamp is switched on and a data logger records the current.

The graph shows the results from the data logger.



(a) Describe in detail how the current varies with time.

Refer to data from the graph in your answer.

(3)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA



- (b) The battery has a voltage of 12 V.

The lamp reaches its normal operating temperature after a short while.

- (i) State the current in the lamp when it is at its normal operating temperature.

(1)

current = A

- (ii) State the relationship between voltage, current and resistance.

(1)

- (iii) Calculate the resistance of the lamp at its normal operating temperature.

Give the unit.

(4)

resistance = unit

- (iv) State the relationship between power, current and voltage.

(1)

- (v) Calculate the power of the lamp at its normal operating temperature.

(2)

power = W

- (c) Suggest why a filament lamp is most likely to fail when it is first switched on.

(2)

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(Total for Question 7 = 14 marks)

