Q1.

The photograph shows an electric skateboard.

(Source: www.digitaltrends.com)

One particular type of electric skateboard uses an electric motor connected to a 22 V rechargeable lithium-ion battery. A fully-charged battery is able to pass 36,000 C of charge through the circuit and will allow continuous operation of the skateboard for 40 minutes.

(a) Calculate the total energy stored in a fully-charged lithium-ion battery.

(2)

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Total energy stored = ...

(b) The electric skateboard travels at a speed of 16 kilometres per hour.

(i) Calculate the time taken for the electric skateboard to travel 2.0 m.

(2)

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Time taken = ...

(ii) While the electric skateboard is in use, the battery provides a constant current.

Calculate the number of electrons that flow past a point in the circuit during the time taken for the electric skateboard to travel 2.0 m.

(3)

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Number of electrons = ...

(Total for question = 7 marks)

Q2.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

The definitions for current and potential difference both include

☐ **A** charge.

☐ **B** resistance.

☐ **C** time.

☐ **D** work done.

(Total for question = 1 mark)