0 3   A hybrid car has an electric motor and a petrol engine.

0 3 . 1   Petrol is a non-renewable energy resource.

What is meant by a non-renewable energy resource?

[1 mark]

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0 3 . 2   The electric motor in the car is powered by a battery.

To charge the battery, the car is plugged into the mains supply at 230 V

The power used to charge the battery is 6.9 kW

Calculate the current used to charge the battery.

[4 marks]

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Current = _____ A

0 3 . 3   Mains electricity is an ac supply.

Explain the difference between direct and alternating potential difference.

[2 marks]

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_____

Turn over ▶

0 3 . 4 The cable used to connect the car to the mains electricity supply has a low resistance.

Explain why it is better to use a cable with a low resistance than to use a cable with a high resistance.

[2 marks]

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Question	Answers	Extra information	Mark	AO / Spec. Ref.	ID
03.1	an energy resource that cannot be replenished as it is used	allow an energy resource that will run out ignore cannot be re-used	1	AO1.1 AO1 in isolation 6.1.3	E
03.2		an answer of 30 (A) scores **4** marks		AO2.1 6.2.4.1	E
	6.9 k(W) = 6900 (W)		1		
	6900 = 230 × I	allow correct substitution of an incorrectly/not converted value for power	1		
	$I = \dfrac{6900}{230}$	allow a correct transformation using an incorrectly/not converted value for power	1		
	I = 30 (A)	allow a correct calculation using an incorrectly/not converted value for power	1		
03.3	direct potential difference is always in the same direction alternating potential difference changes direction	allow direct current is always in the same direction allow alternating current changes direction	1 1	AO1.1 6.2.3.1	E
03.4	lower potential difference across the cable it is more efficient **OR** (lower resistance gives) a greater current (for the same potential difference) (1) so the car battery can charge faster (1)	allow lower power/energy dissipation allow it won't get as hot	1 1	AO1.1 6.1.2.2 6.2.4.1	E
Total			**9**		