3 **(a)** Define power.

.....

..... [1]

(b) An electric car is powered by a motor. The car is travelling at a constant speed of $35\,m\,s^{-1}$ along a straight horizontal road, as shown in Fig. 3.1.

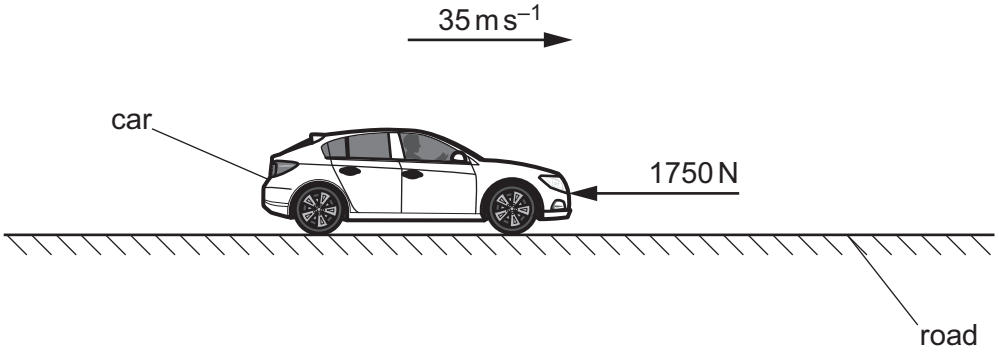

Fig. 3.1

There is a total resistive force of 1750 N acting on the car.

(i) Calculate the power transmitted to the wheels of the car by the motor.

power = ...W [2]

(ii) Calculate the useful work done by the motor when the car travels a distance of 17 km.

work done = ... J [2]

(iii) The potential difference (p.d.) across the motor has a constant value of 600 V and the motor has an efficiency of 85%.

Calculate the current in the motor.

current = ...A [3]

(c) The car in **(b)** now reaches a slope, as shown in Fig. 3.2.

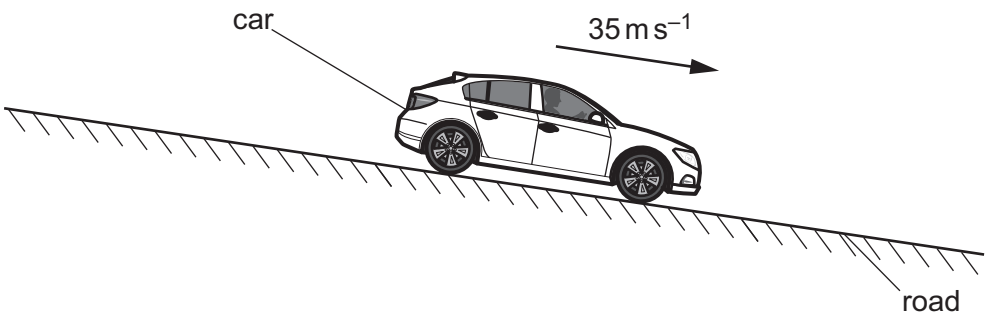

Fig. 3.2

The car continues down the slope at the same speed as in **(b)**.

State and explain the effect, if any, of the slope on:

(i) the air resistance acting on the car

.....

..... [1]

(ii) the current in the motor.

.....

..... [1]

[Total: 10]