

3 (a) Define power.

.....  
 ..... [1]

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

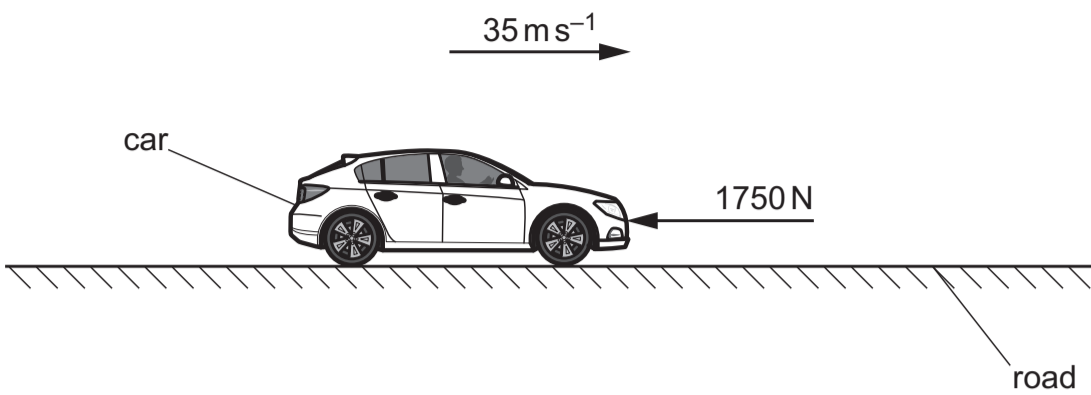


Fig. 3.1

There is a total resistive force of  $1750 \text{ N}$  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  $17 \text{ km}$ .

work done = ..... J [2]

(iii) The potential difference (p.d.) across the motor has a constant value of  $600 \text{ V}$  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.

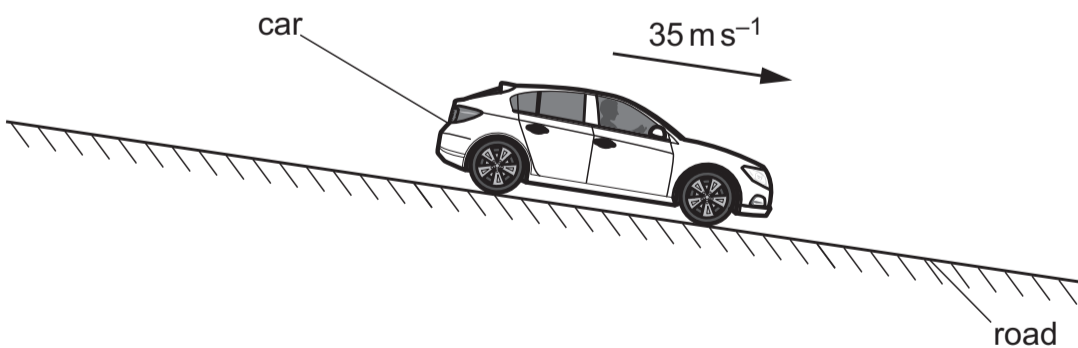


Fig. 3.2

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]