15 An electric car travels at a constant speed of 70 km h^{-1} for 80 km on a straight horizontal road and uses energy E from its battery.

The total resistive force acting on the car is proportional to (speed)^2. Assume that the electric motor is 100% efficient.

How much energy is used from the battery when the car travels at a constant speed of 60 km h^{-1} for 80 km on the straight horizontal road?

A 0.73E **B** 0.86E **C** 1.2E **D** 1.4E

16 What is meant by the efficiency of a system?

A the total energy input to the system divided by the useful energy output by the system

B the useful energy output from the system divided by the energy wasted by the system

C the useful energy output from the system divided by the total energy input to the system

D the energy wasted by the system divided by the total energy input to the system

17 When an object of mass m is raised through a vertical height Δh, the gain of its gravitational potential energy is ΔE_P.

ΔE_P and Δh are related by the equation

$$\Delta E_P = mg\Delta h,$$

where g is the acceleration of free fall.

The definition of which physical quantity is needed to derive this equation?

A acceleration

B momentum

C power

D work done