2(a) Define work done and state its SI unit. [2]

(b) Energy can be defined as the ability to do work. Calculate the work that can be done in each of the following situations.

In each case state a possible object on which the work may be done and also explain how the law of conservation of energy can be applied.

The first situation is an example of how the question should be answered.

Situation

Numerical value of

the work that can

be done

On what object is the

work done?

Application of

conservation of

energy

Car

mass 1200 kg

stopping without

skidding from a speed

of 30 m s^{-1}

kinetic energy =

½ x 1200 x 30^2

= 540 000J

work is done on the

brakes

almost all of the kinetic

energy becomes heat

energy

Hot air balloon

mass 800 kg landing

from an altitude of 1500m moving at constant speed

[1]
[1]
[1]

Battery

e.m.f 12.0V pushing a

total charge of 800 C

through an electric

drill

[2]
[1]
[2]