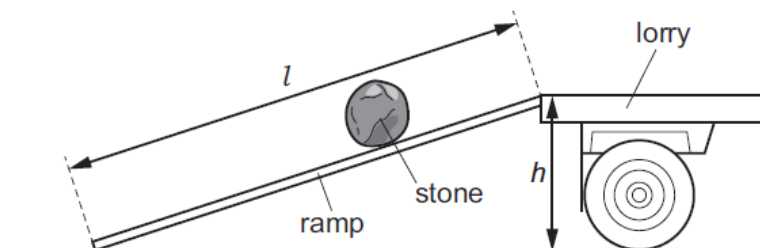**Energy, work and power – 2023 June O Level Physic 5054**

1. June/2023/Paper_ 5054/11/No.11

   A large stone is rolled onto a lorry using a ramp.

   The length of the ramp is l. The stone is lifted a height of h.

   The mass of the stone is m. The weight of the stone is W.

   Which expression is equal to the useful work done on the stone?

   A $m \times h$ **B** $W \times h$ **C** $m \times l$ **D** $W \times l$

2. June/2023/Paper_ 5054/11/No.12

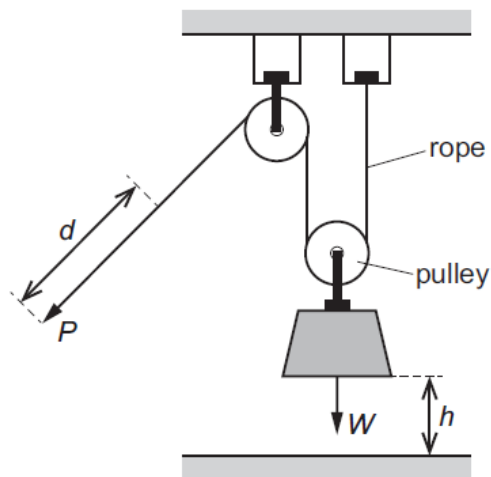   The diagram shows a burning candle.

   Which energy store is associated with the burning candle?

   A   chemical

   B   elastic

   C   electrostatic

   D   nuclear

3. June/2023/Paper_ 5054/12/No.12

A worker pulls a rope with a force P through a distance d in the direction of the force as shown.

This causes a block of weight W to move vertically upwards through a height h.

How much work is done by the worker?

A Ph **B** Pd **C** $(P + W)h$ **D** $(P + W)d$

4. June/2023/Paper_ 5054/12/No.13

A battery is connected in a circuit to light a lamp.

What is the energy store in the battery?

A   chemical

B   electrostatic

C   gravitational

D   kinetic

2

5. June/2023/Paper_ 5054/22/No.2

Fig. 2.2 shows a rider on an electric scooter.

Fig. 2.2

The scooter contains a battery and a motor to drive the back wheel.

(a) (i) State the name of the energy store in the battery.

.... [1]

(ii) Describe, in terms of work done, the stages of energy transfer from the energy store in the battery to the kinetic energy of the scooter.

....

....

....

.... [2]

(b) The total mass of the scooter and the rider is 70 kg.

Calculate the total kinetic energy of the rider and scooter when the scooter has a speed of 4.0 m/s.

kinetic energy = ... J [2]

(c) The battery is marked 'energy capacity 0.35 kilowatt-hour (kW h)'.

(i) Define what is meant by a kilowatt-hour.

....

.... [1]

(ii) The scooter stops working because the battery is totally discharged (flat). This means that there is no more energy stored in the battery.

The battery is then recharged using a 70 W power supply.

Calculate the time taken to fully recharge the battery.

time = ... hours [2]

[Total: 8]