Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic : 8_Energy Forces Doing Work

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Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Q1.

A cyclist is riding a bicycle at a steady velocity of 12 m/s.
The cyclist and bicycle have a total mass of 68 kg.
Calculate the kinetic energy of the cyclist and bicycle.
Use the equation

$$KE = \frac{1}{2} \times m \times v^2$$

(2)

kinetic energy = ... J

(Total for question = 2 marks)

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Q2.

The espresso machine shown in Figure 27 is an electrical appliance.

(Source: © tanawaty/123RF)

Figure 27

The espresso machine has a steam pipe that can be used to heat milk in a jug, as shown in Figure 28.

(Source: © Wavebreak Media Ltd/123RF)

Figure 28

Steam from the pipe enters the milk, where steam condenses to water.

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The steam and hot water heat the milk.

(i) Describe, in terms of energy, how the arrangement and movement of particles in the steam changes as the steam enters the milk, condenses and cools.

(2)

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(ii) The specific heat capacity of milk is 3840 J/kg K.

The specific heat capacity of water is 4200 J/kg K.
The specific latent heat of condensation of steam is 2260 kJ/kg.
The temperature of the steam is 100°C
The mass of steam that condenses is 25 g.
The temperature of the milk rises from 5°C to 65°C.
By considering the transfer of energy from the steam to the milk, calculate the mass of milk that is heated by the steam and hot water.
Use equations from the formula sheet.

(4)

mass of milk = ... kg

(iii) Give **two** reasons why the actual mass of steam needed to heat the milk from 5°C to 65°C is greater than 25 g.

(2)

1 .....

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2 .....

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(Total for question = 8 marks)

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Q3.

Figure 8 shows a demolition ball of mass 400 kg.

The ball is used to demolish a wall.

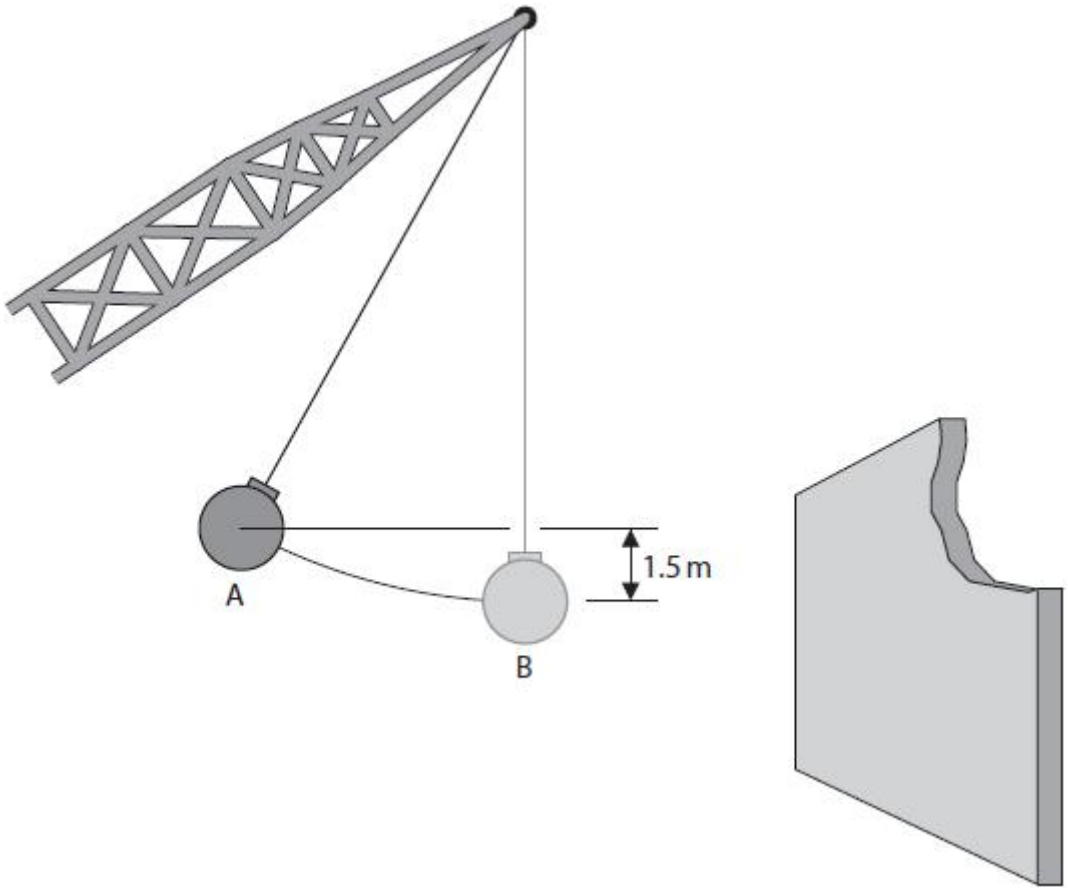

Figure 8

As the ball swings from A to B, it moves through a vertical height of 1.5 m.

(i) Calculate the change in gravitational potential energy.

Take gravitational field strength, g, to be 10 N/kg.

(3)

(ii) The heavy ball comes to rest soon after smashing into the wall. In doing this, the temperatures of the ball, wall and surroundings all increase slightly.

Explain this observation.

(2)

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(iii) Which of these quantities of the ball changes in **both** magnitude and direction while the ball is swinging?

Put a cross ☒ in the box next to your answer.

(1)

- ☐ **A** gravitational potential energy
- ☐ **B** velocity
- ☐ **C** the gravitational force acting
- ☐ **D** kinetic energy

(Total for question = 6 marks)

Q4.

An electric motor is used to lift a box.

Figure 2 shows how the efficiency of the electric motor changes as the mass of the box increases.

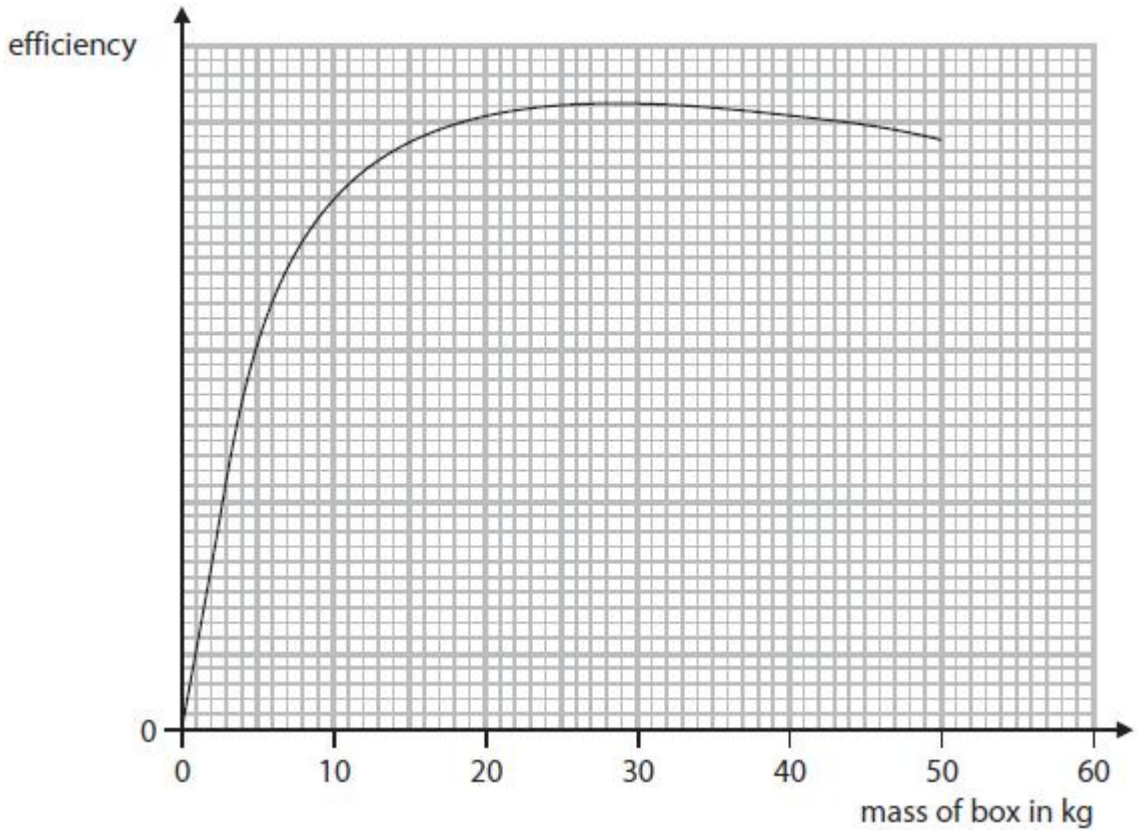

Figure 2

Describe how the efficiency of the electric motor depends on the mass of the box lifted.

(2)

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(Total for question = 2 marks)

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