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 : 21 Marks **Time : 21 Minutes**

Q1.

Figure 1 shows part of a roller coaster ride seen from the side.

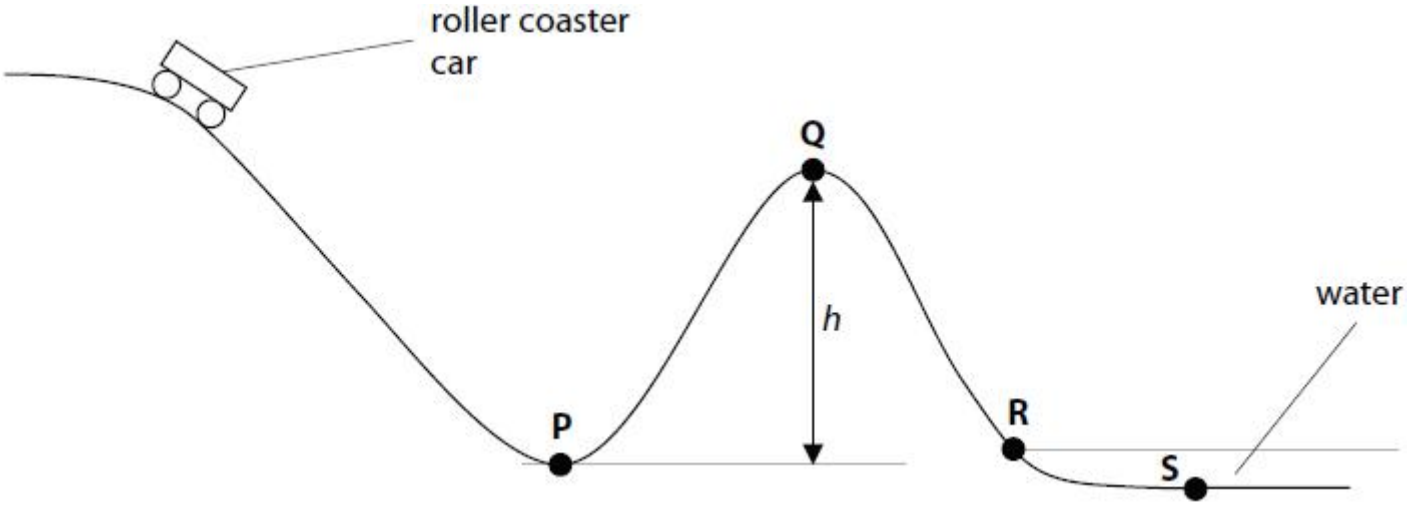

Figure 1

The car enters a pool of water at **R**. It slows down and stops at **S**.

Describe how the total energy of the system is conserved as the car travels between **R** and **S**.

(2)

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(Total for question = 2 marks)

Q2.

* A student has the equipment shown in Figure 12.

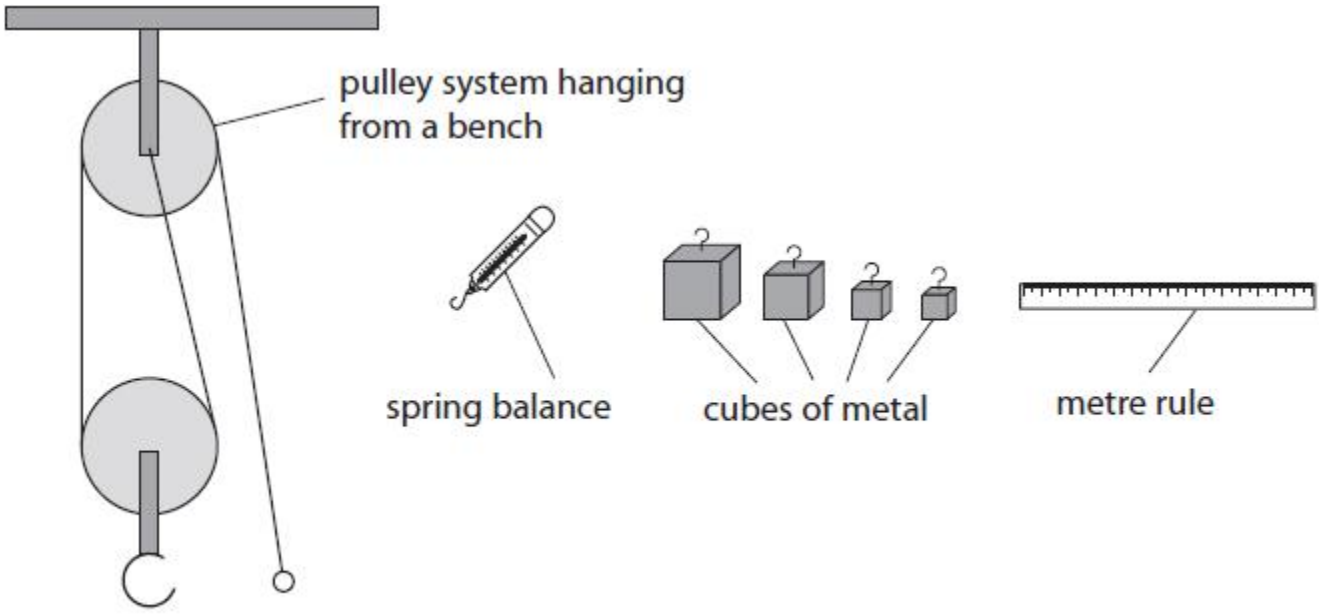

Figure 12

Devise an experiment to investigate how the efficiency of the pulley system varies with the weight of metal being lifted.

Your answer should include how you will use your measurements.

(6)

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(Total for question = 6 marks)

Q3.

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.

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

Describe the energy transfers that happen when the cyclist uses the brakes to stop.

(2)

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(Total for question = 2 marks)

Q4.

The International Space Station (ISS) has several solar panels called wings.

(a) The wings convert energy from the Sun into a form useful in the ISS.

(1)

- ☒ **A** transverse and electromagnetic
- ☒ **B** electromagnetic but not transverse
- ☒ **C** transverse but not electromagnetic
- ☒ **D** neither transverse nor electromagnetic

(b) In one second, the useful energy available from one wing is 34.3 kJ.
The energy incident on the wing from the Sun is five times this amount.

What is the percentage efficiency of the wing?

(3)

efficiency = ... %

(c) A wing is in direct sunlight.
The ISS is not receiving energy from the wing.
The temperature of the wing remains constant.

Explain why the temperature of the wing remains constant in these conditions.

(2)

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Q5.

Figure 8 shows a demolition ball of mass 400 kg.

The ball is used to demolish a wall.

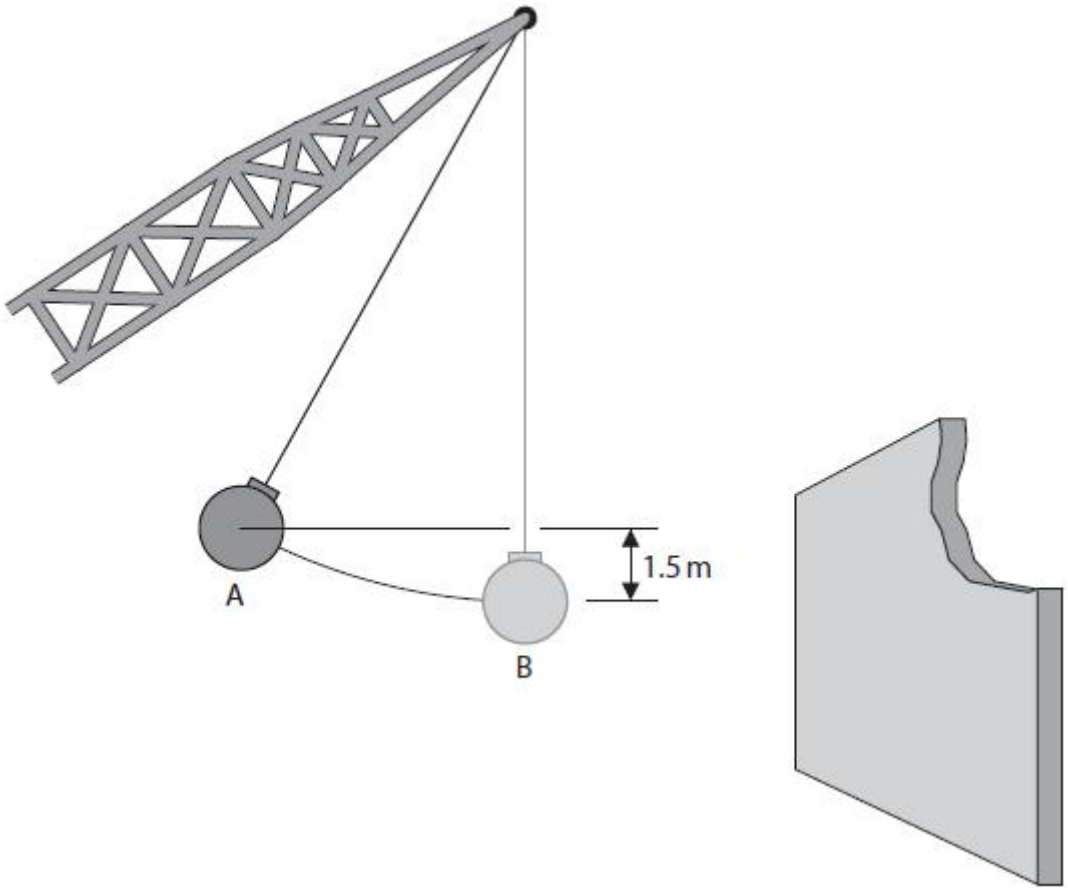

Figure 8

* After knocking down the wall, the ball will swing **freely**.

The graph in Figure 9 shows how the height of the ball above ground varies with time during three swings.

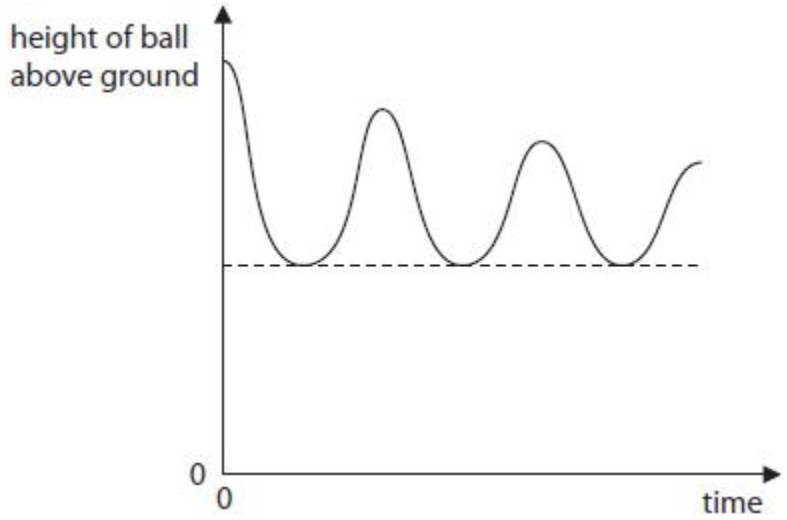

Figure 9

Explain how the energy within the system changes during this time.

The system consists of the swinging ball and its surroundings.

(6)

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(Total for question = 6 marks)

Q6.

(i) Figure 14 shows the vertical forces on an aeroplane.

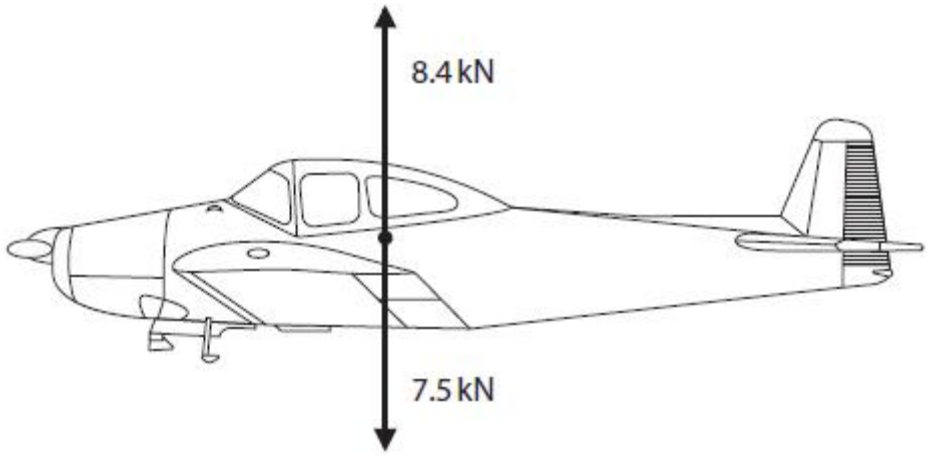

Figure 14

Use information from the diagram to determine the size and direction of the resultant vertical force on the aeroplane.

(2)

size = ... kN, direction is .....

(ii) The aeroplane is descending.

Figure 15 shows a diagram of the resultant vertical and horizontal forces on the aeroplane as it is descending.

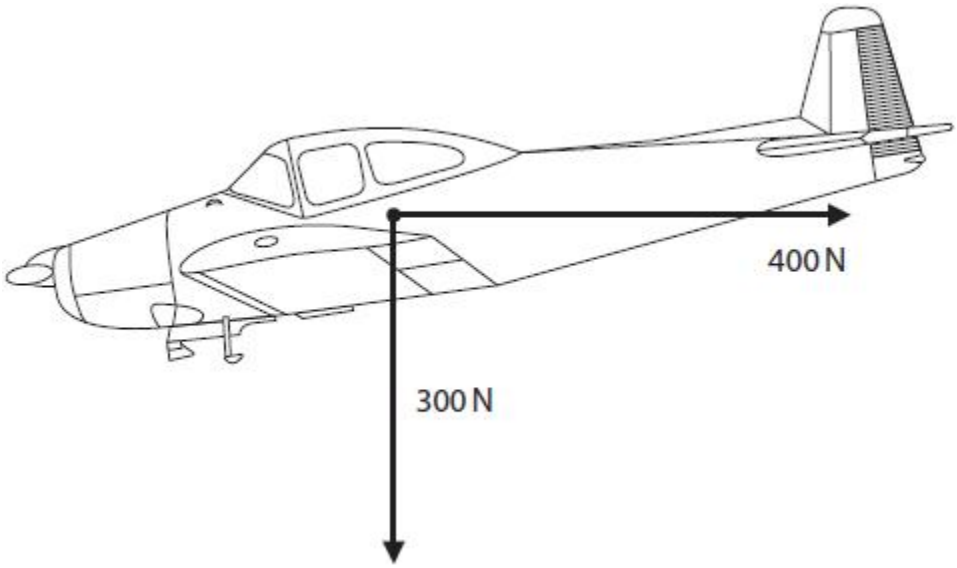

Figure 15

Complete the diagram to show the resultant of these two forces.

(1)

(iii) The mass of the aeroplane is 750 kg.

Calculate the change in gravitational potential energy of the aeroplane as it descends from 1300 m to the

ground.
Gravitational field strength (g) = 10 N/kg

(2)

energy = ... J

(Total for question = 5 marks)