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

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Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Q1.

A ball has a mass of 0.046 kg.

(i) Calculate the change in gravitational potential energy when the ball is lifted through a vertical height of 2.05 m.

Use the equation

$$\Delta GPE = m \times g \times \Delta h$$

(2)

change in gravitational potential energy = ... J

(ii) The ball is released.

Calculate the kinetic energy of the ball when the speed of the ball is 3.5 m/s.

(3)

kinetic energy of the ball = ... J

(iii) The ball bounces several times.

Figure 1 shows how the height of the ball above the floor changes with time.

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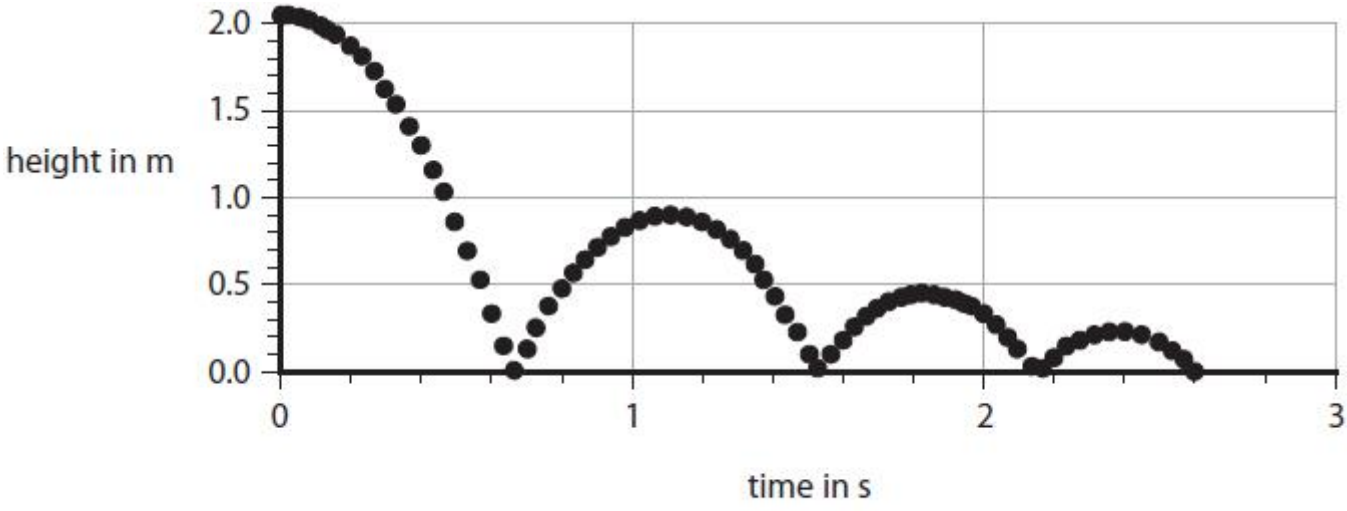


Figure 1

Use Figure 1 to estimate the maximum height that the ball reaches after the first bounce.

(1)

height after first bounce = ... m

(iv) Explain why the ball does not bounce back to its starting height of 2.05 m.

(2)

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(Total for question = 8 marks)

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Q2.

Figure 6 shows a 'Mars rover' descending to the surface of the planet Mars.

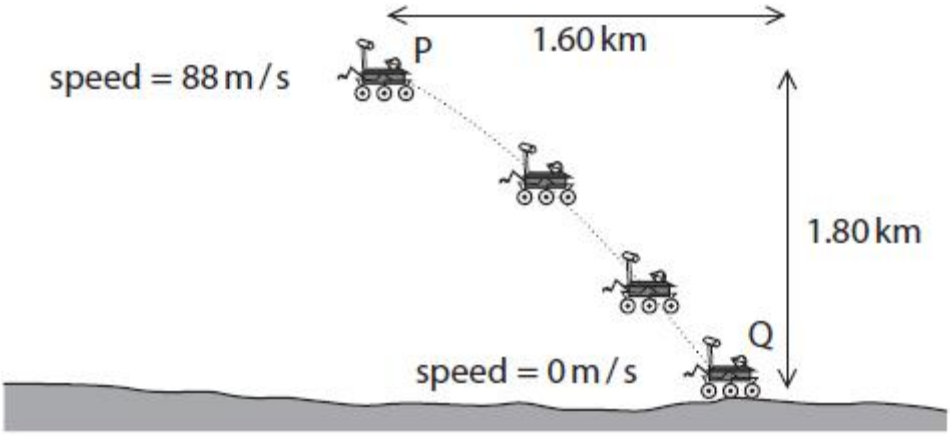


Figure 6

(i) Calculate the change in gravitational potential energy of the rover as it descends from position P to position Q.

Mass of rover = 1100 kg
Gravitational field strength on Mars = 3.7 N / kg
Give your answer to 2 significant figures.

(3)

change in gravitational potential energy = ... J

(ii) Use data from Figure 6 to calculate the change in kinetic energy of the rover as it descends from position P to position Q.

(2)

change in kinetic energy = ... J

(iii) The rover is slowed down safely using thrusters and a parachute (not shown in Figure 6).

The thrusters use jets of gas to control movements and the parachute is designed to be used in the atmosphere of Mars.
Describe the energy changes involved in terms of the work done by various forces as the rover descends.

(3)

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(Total for question = 8 marks)

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Q3.

A drone has a mass of 4.5 kg.

This drone rises from the ground to a height of 20 m.

(i) Calculate the change in gravitational potential energy when the drone rises through a height of 20 m.

The gravitational field strength g = 10N/kg.

(2)

change in gravitational potential energy = ... J

(ii) State the amount of useful work done by the blades as the drone rises through 20 m.

(1)

useful work done = ... J

(iii) It takes 4 s for the drone to rise through 20 m.

Calculate the useful power developed by the blades in this time of 4 s.

(2)

useful power developed = ... W

(Total for question = 5 marks)

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