Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic : 3_Conservation Of Energy

Name of the Student:_____
Max. Marks : 19 Marks **Time : 19 Minutes**

Q1.

Shot-put is an Olympic event.
The shot is a heavy ball.
An athlete throws the shot as far as possible.

A sports scientist analyses an athlete's throw to help improve performance.

In one throw, the shot continues to rise by another 1.3 m after it leaves the athlete's hand.
The mass of the shot is 7.26 kg.

Calculate the amount of gravitational potential energy gained by the shot.

(2)

gravitational potential energy gained = ... J

(Total for question = 2 marks)

Q2.

Figure 13 shows two ice skaters during a performance.

Figure 13

(i) The two ice skaters are travelling together in a straight line at 3.50 m/s.

Their total momentum is 371 kgm/s.
The man has a mass of 64.5 kg.
Calculate the mass of the woman.

(4)

mass = ... kg

(ii) Calculate the kinetic energy of the man.

(2)

kinetic energy = ... J

(Total for question = 6 marks)

Q3.

A stone is held at rest above the ground.

The stone is released and falls until its velocity is 17 m / s.

Calculate the distance the stone has fallen when its velocity has reached 17 m / s.

(2)

distance = ... m

(Total for question = 2 marks)

Q4.

Figure 2 shows a person on a skateboard at the top of a ramp.

At P, the person is not moving.

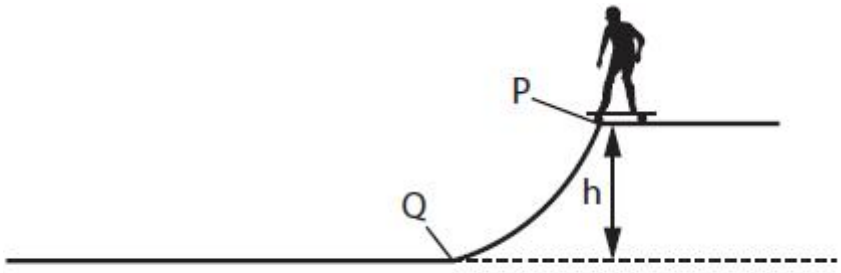

Figure 2

The person rides the skateboard down the ramp from P to Q.

The gravitational potential energy of the person decreases by 980 J.

The mass of the person is 35 kg.

Calculate h, the height of the ramp.

Use g = 10 N/kg.

Use the equation

change in gravitational potential energy = $m \times g \times h$

(2)

h = ... m

(Total for question = 2 marks)

Q5.

Figure 5 shows a football kicked against a wall.

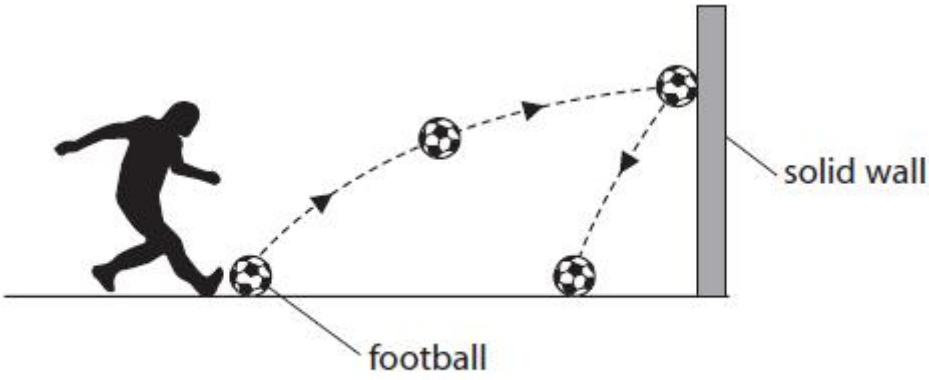

Figure 5

The football has a mass of 0.42 kg.

(i) The football gains 11 J of gravitational potential energy as it moves from the ground to the wall.

Calculate the height at which the ball hits the wall.

(3)

Gravitational field strength = 10 N / kg
Use the equation

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

height = ... m

(ii) Calculate the kinetic energy of the football when it is moving at a velocity of 12 m / s.

(2)

Use the equation

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

kinetic energy = ... J

(iii) Describe the energy transfers that happen when the ball hits the wall.

(2)

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(Total for question = 7 marks)