Name of the Student:_____
Max. Marks : 17 Marks **Time : 17 Minutes**

Q1.

This question is about energy changes.

Figure 8 shows a water slide.
A person travels from the top to the bottom of the water slide.

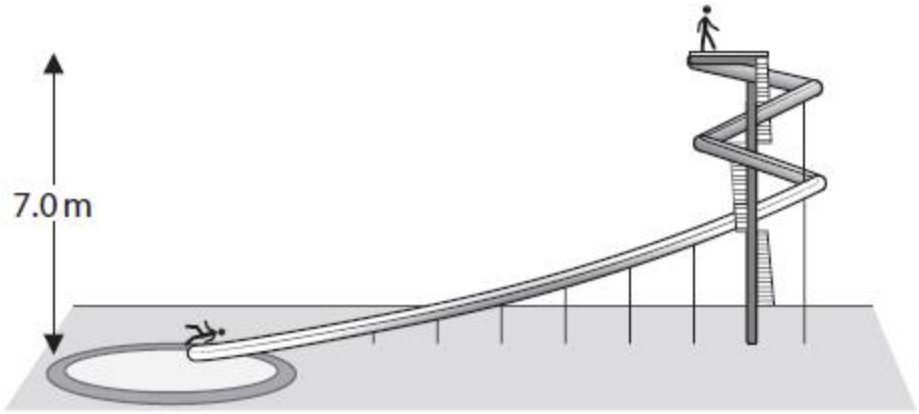


Figure 8

(i) The mass of the person, m = 72 kg.

The change in vertical height, h = 7.0 m
Gravitational field strength, g = 10 N / kg
Calculate the change in gravitational potential energy for the person.
Use the equation

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

(2)

change in gravitational potential energy = ... J

(ii) The person comes to rest after the end of the water slide.

Explain what happens to the energy as the person comes to rest after the end of the water slide.

(2)

Downloaded from www.merit-minds.com

.....

.....

(Total for question = 4 marks)

Q2.

A rock falls off the top of a cliff of height *h*.

Figure 8 shows the rock falling.

The Earth exerts a force of 150 N on the rock.

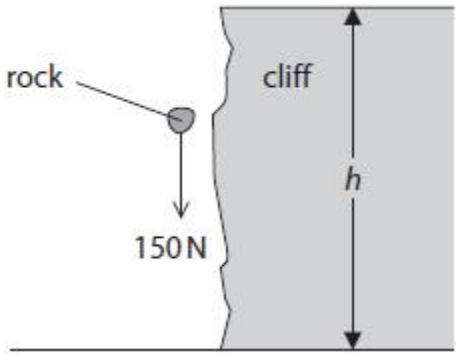


Figure 8

The work done by this force when the rock falls from the top to the bottom of the cliff is 2700 J.

(i) Calculate the height, *h*, of the cliff.

(2)

h = ... m

(ii) State the value of the kinetic energy of the rock just before it hits the ground.

(1)

kinetic energy = ... J

Downloaded from www.merit-minds.com

(iii) The mass of the rock in Figure 8 is 15 kg.

Calculate the velocity of the rock just before it reaches the bottom of the cliff.

(2)

velocity = ... m/s

(Total for question = 5 marks)

Q3.

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

Downloaded from www.merit-minds.com

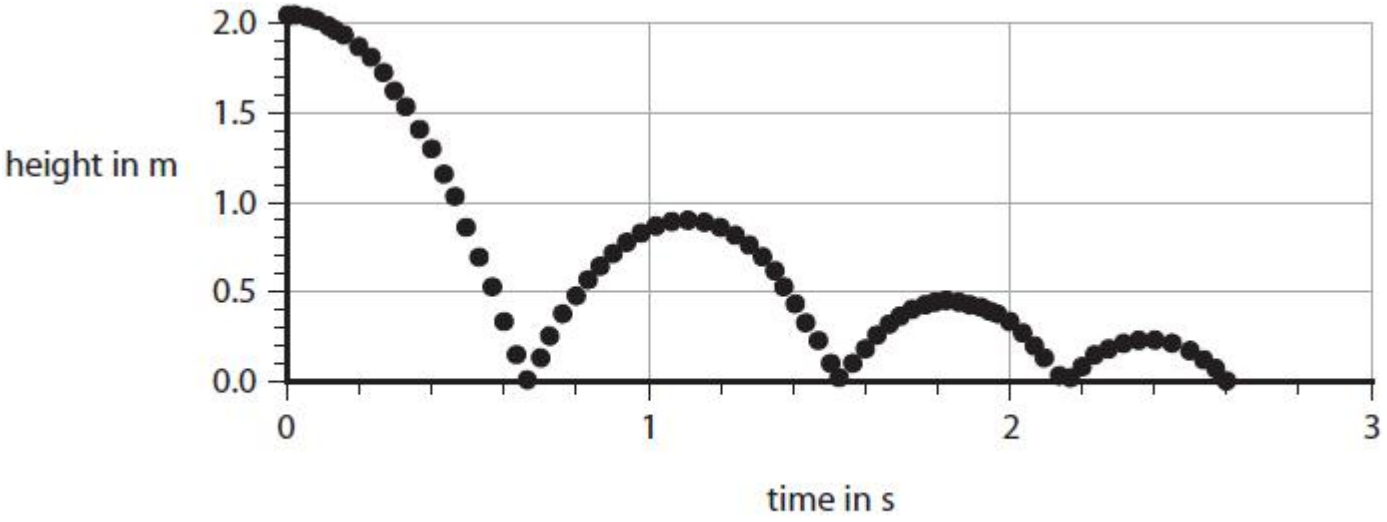


Figure 7

Use Figure 7 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)

.....

.....

.....

.....

(Total for question = 8 marks)

Downloaded from www.merit-minds.com