

Name of the Student: _____

Max. Marks : 22 Marks

Time : 22 Minutes

Q1.

Figure 1 shows a child's toy.

A child pushes down on the toy to compress the spring. The spring then launches the toy into the air.

Figure 1



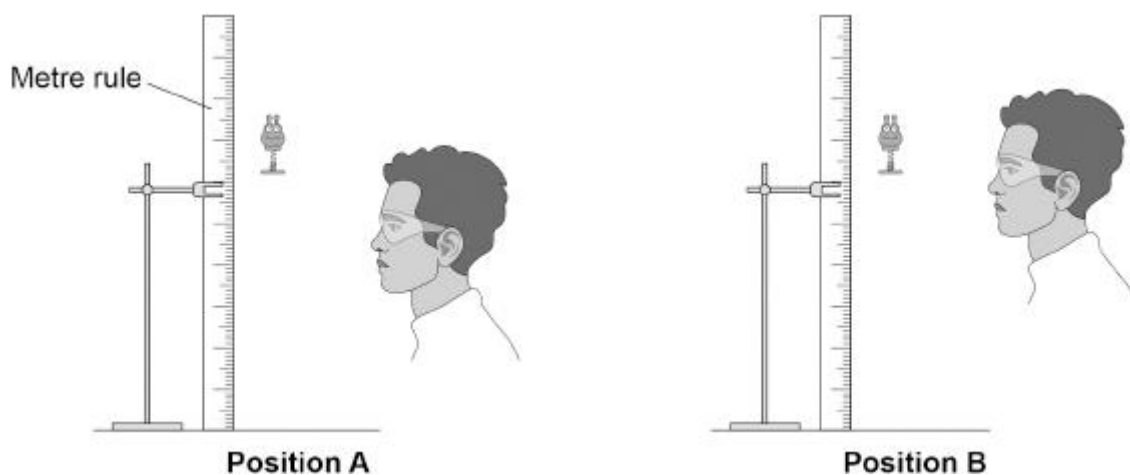
(a) A student measured the maximum height reached by the toy.

The student placed a vertical metre rule near the toy, and observed the height reached by the toy.

The student repeated the experiment, observing from a different position.

Figure 2 shows the toy at its maximum height and the two positions of the student.

Figure 2



Observing the toy from **position B** instead of **position A** affected the measurement of the maximum height reached by the toy.

The figure below shows a device that uses a mug of hot coffee to turn a wheel.



- (a) The hot coffee increases the temperature of the air in the chamber.

Explain how the pressure in the chamber changes.

(3)

- (b) For the device to work, the air in the chamber must increase in temperature quickly.

Explain why the bottom of the air chamber is made of metal rather than plastic.

(2)

- (c) The mass of air in the chamber is constant.

What property of air allows a small change in internal energy to cause a large temperature change to the air in the chamber?
