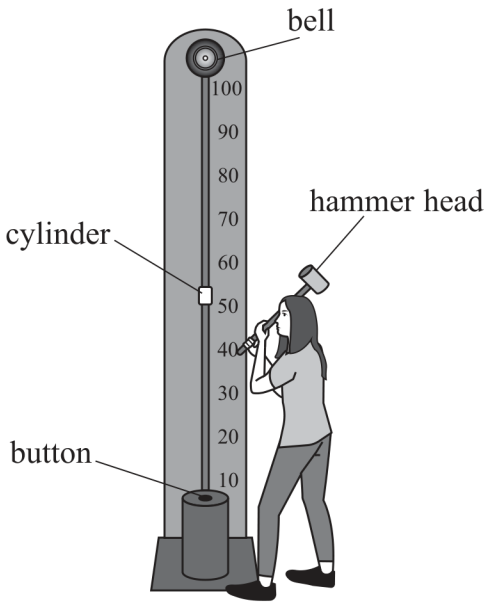
17 In a game called 'High Striker' a person hits a button with a hammer. This causes a cylinder to move towards the bell at the top, as shown.



(a) The kinetic energy of the hammer head as it hits the button is greater than the change in gravitational potential energy of the hammer head as it moves down.

Explain why.

(3)

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(b) The hammer is initially at rest at its highest point. As the person moves the hammer head towards the button, the average resultant force on the hammer head is 58 N.

The hammer head moves a distance of 1.2 m before hitting the button. The cylinder must move 2.7 m upwards to hit the bell.

Deduce whether the cylinder hits the bell.

mass of cylinder = 0.15 kg
efficiency of energy transfer = 4.0 %

(5)

(c) If the velocity of the hammer head as it hits the button doubles, the height gained by the cylinder does **not** double.

Explain why.

(2)

(Total for Question 17 = 10 marks)