

Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Q1.

Figure 9 shows a spring standing on a table.

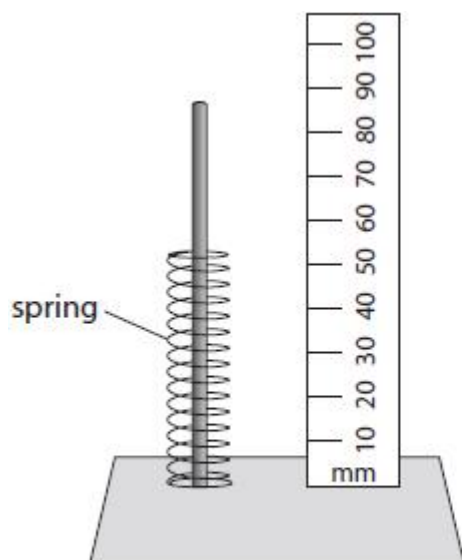


Figure 9a

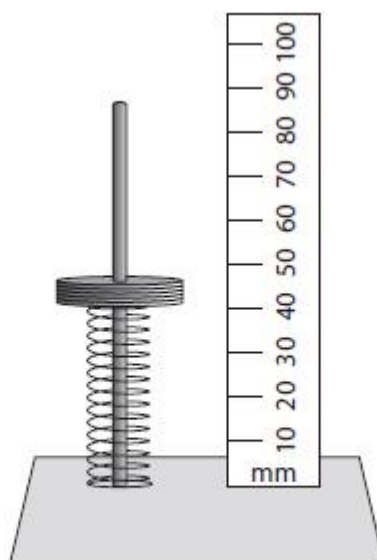


Figure 9b

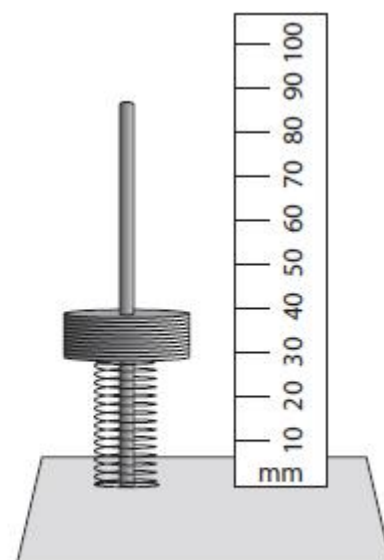


Figure 9c

Weights are added to the spring as shown in Figures 9b and 9c.

(i) Estimate the original length of the spring as shown in Figure 9a.

(1)

original length = mm

(ii) Describe how the reduction in the length of the spring when weights are added can be determined.

(2)

.....

(iii) State **two** ways that the experimental procedure could be improved.

(2)

1

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2

- (iv) Give **one** reason why the reduction in length eventually reaches a limit as more weights are added.

(1)

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(Total for question = 6 marks)

Q2.

A student sets up the apparatus shown in Figure 9.

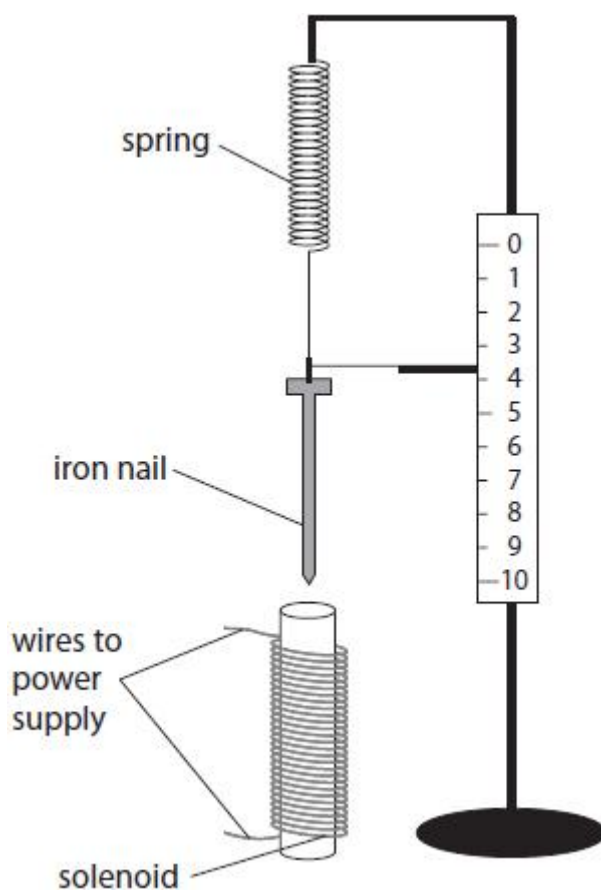


Figure 9

- (i) When the current in the solenoid is switched on, the solenoid attracts the iron nail.

Describe how the student could use this apparatus to investigate how the size of the current in the solenoid affects the force of attraction between the solenoid and the iron nail.

(4)

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(ii) The spring constant of a different spring is 24 N/m.

The spring is extended from its unstretched length by 12 cm.

Calculate the energy transferred in extending the spring by 12 cm.

Use an equation selected from the list of equations at the end of this paper.

(2)

energy transferred = J

(Total for question = 6 marks)

Q3.

Another spring is extended.

The work done to extend the spring is 0.14 J.

The spring constant of the spring is 175 N/m.

Calculate the extension of the spring.

Use an equation selected from the list of equations at the end of this paper.

(3)

extension of spring = m

Q4.

Figure 6 shows part of the inside of a pen.

The pen contains a spring that can be compressed.

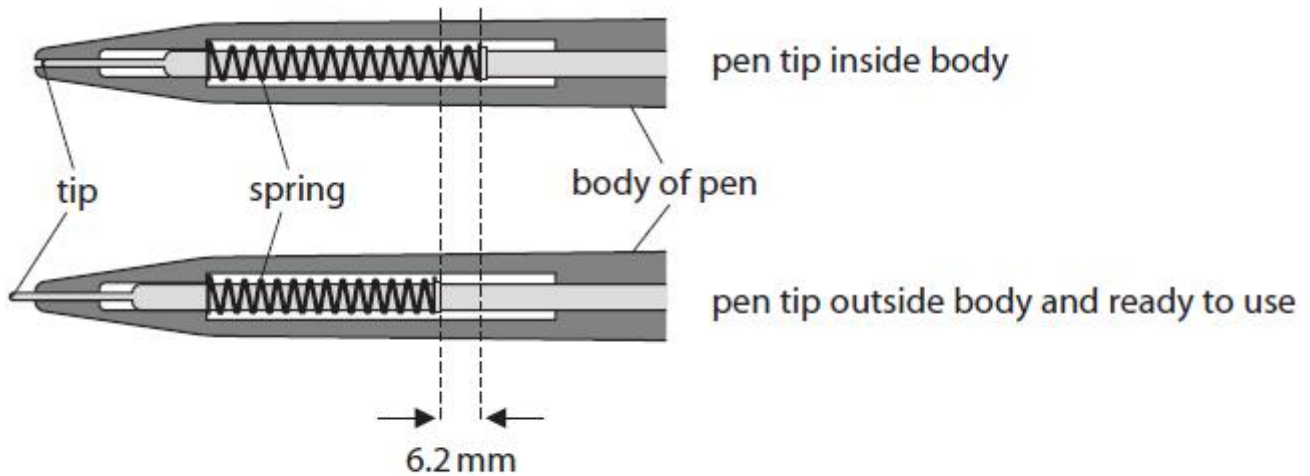


Figure 6

The spring constant of the spring is 260 N/m.

(i) Calculate the force needed to compress the spring by the amount shown in Figure 6.

Give your answer to an appropriate number of significant figures.

(3)

force = N

(ii) A student removes the spring from the pen and investigates the compression of the spring.

Figure 7 shows the equipment and the procedure that the student uses.

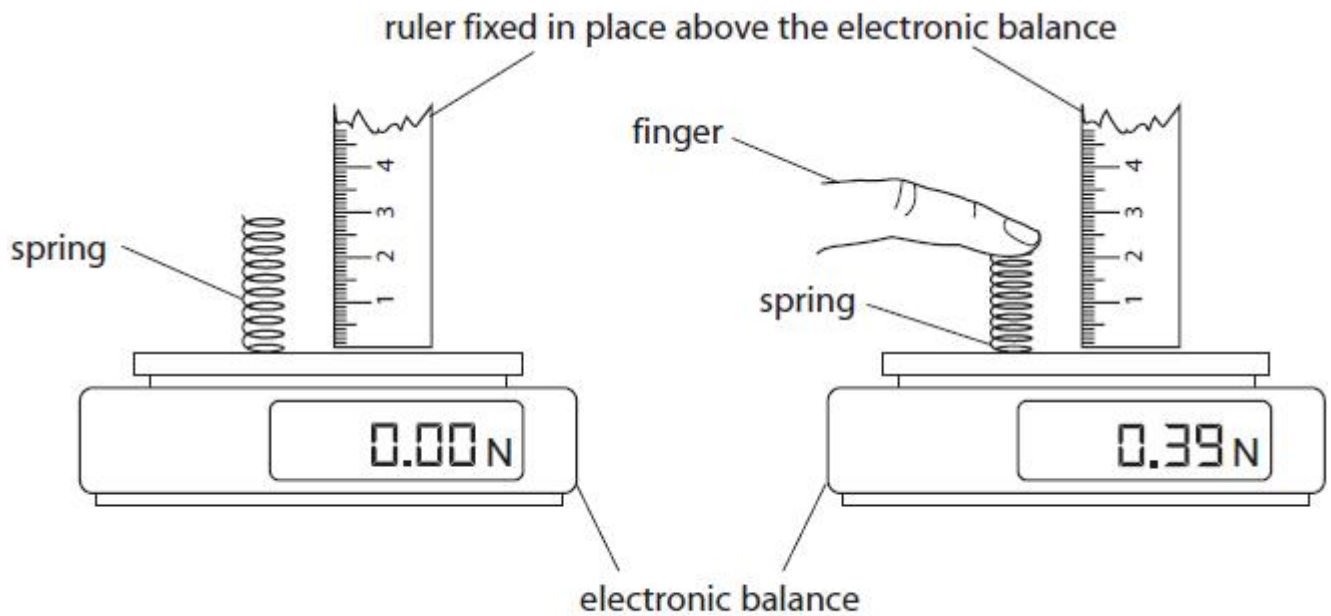


Figure 7

The student presses down on the spring to change its length.

The electronic balance measures the force applied to the spring.

Describe how the student can determine the change in length of the spring. You may add to Figure 7 to help your answer.

(3)

(iii) The student finds it difficult to make an accurate measurement of the change in length of the spring using the equipment as shown.

Describe **one** way that the student could improve the procedure.

(2)

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(Total for question = 8 marks)