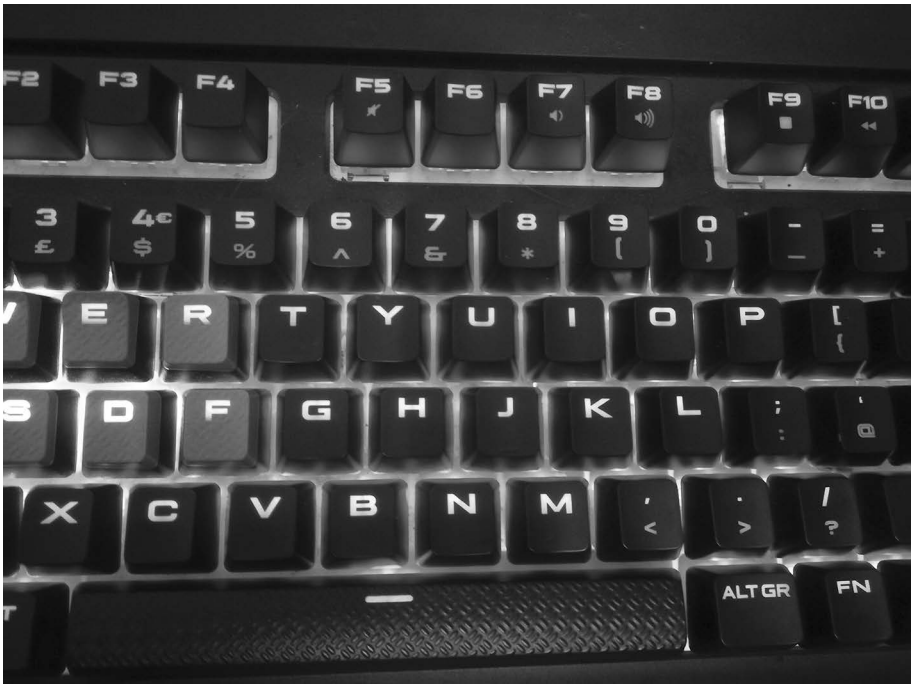
Do not write outside the box

0 3 **Figure 5** shows a computer keyboard.

There is a spring under each key.

Figure 5



0 3 . 1 The springs behave elastically when a force is applied.

What is meant by elastic behaviour?

[1 mark]

Tick (✓) **one** box.

The spring will be compressed when the force is applied to it. ☐

The spring will become deformed when the force is applied to it. ☐

The spring will become longer when the force is removed. ☐

The spring will return to its original length when the force is removed. ☐

Turn over ►

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0 3 . 2 Suggest **two** properties that should be the same for each spring.

[2 marks]

1 _____

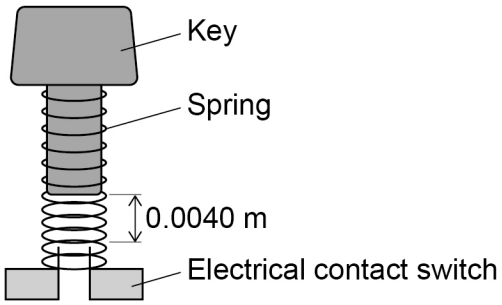
_____

2 _____

_____

0 3 . 3 **Figure 6** shows one of the keys and its spring.

Figure 6



The key must be pressed with a minimum force of 0.80 N before the key touches the switch.

Calculate the spring constant of the spring in **Figure 6**.

[3 marks]

_____

_____

_____

_____

_____

_____

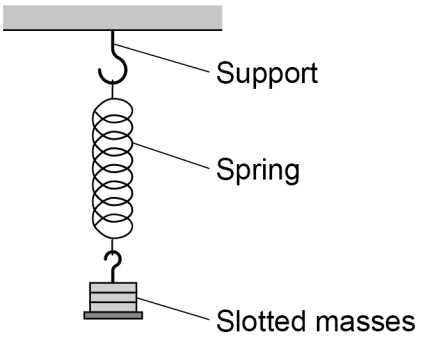
Spring constant = _____ N/m

Do not write outside the box

0 3 . 4 **Figure 7** shows a spring that has been hung from a support.

The spring is stationary and has been stretched beyond its limit of proportionality.

Figure 7



Which **two** statements are true for the spring in **Figure 7**?

[2 marks]

Tick (✓) **two** boxes.

The elastic potential energy of the spring is zero. ☐

The extension of the spring is directly proportional to the force applied. ☐

The upward force on the spring is equal to the downward force. ☐

The spring cannot be stretched any further. ☐

The spring is inelastically deformed. ☐

8

Turn over for the next question

question	Answers	Extra information	Mark	AO / Spec. Ref.
03.1	the spring will return to its original length when the force is removed		1	AO1 6.5.3
03.2	Any **two** from: • spring constant • (original) length • diameter		2	AO3 6.5.3
03.3	0.80 = k × 0.0040 $k = \frac{0.80}{0.0040}$ k = 200 (N/m)		1 1 1	AO2 6.5.3
03.4	the upward force on the spring is equal to the downward force the spring is inelastically deformed		1 1	AO3 6.5.3
Total			**8**	