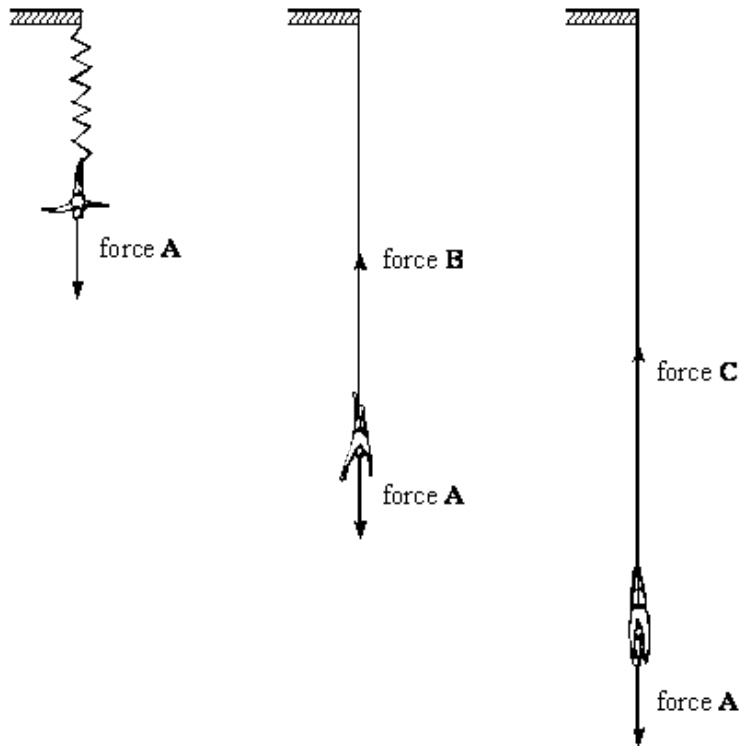


- Q1.** When a bungee-jump is made the jumper steps off a high platform. An elastic cord from the platform is tied to the jumper. The diagram below shows different stages in a bungee-jump. Forces **A**, **B** and **C** are forces acting on the jumper at each stage.



moving down
large acceleration

diagram **X**
moving down
large acceleration

diagram **X**

moving down
small acceleration

diagram **Y**
moving down
small acceleration

diagram **Y**

moving down
slowing acceleration

diagram **Z**
moving down
slowing acceleration

diagram **Z**

- (a) Name force **A**.

.....

(1)

- (b) The motion of the jumper is shown in the diagrams.
By comparing forces **A**, **B** and **C**, state how the motion is caused in:

- (i) diagram **X**;

.....

- (ii) diagram **Y**;

.....

- (iii) diagram **Z**.

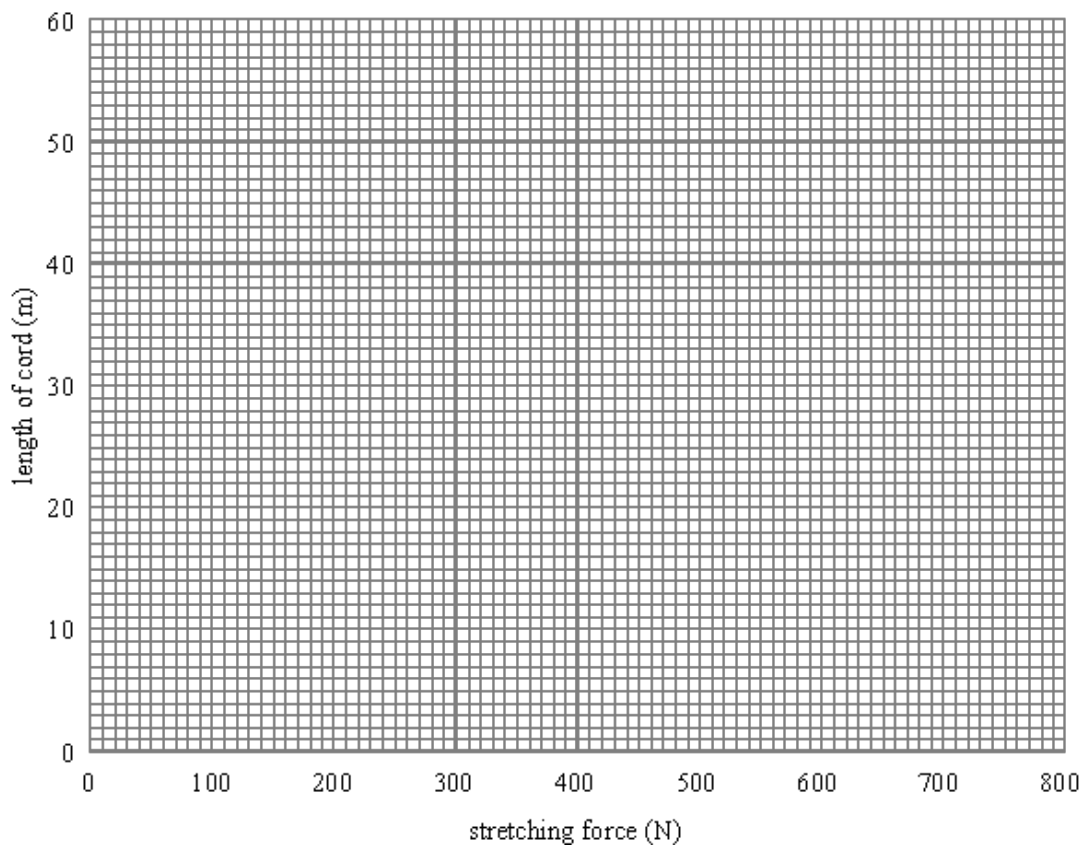
.....

(3)

- (c) The table gives results for a bungee cord when it is being stretched.

STRETCHING FORCE (N)	100	200	400	600	800
LENGTH OF CORD (m)	20	24	32	40	48

- (i) Plot a graph of these results on the graph paper.



(3)

- (ii) Use the graph to find the length of the cord before it was stretched.

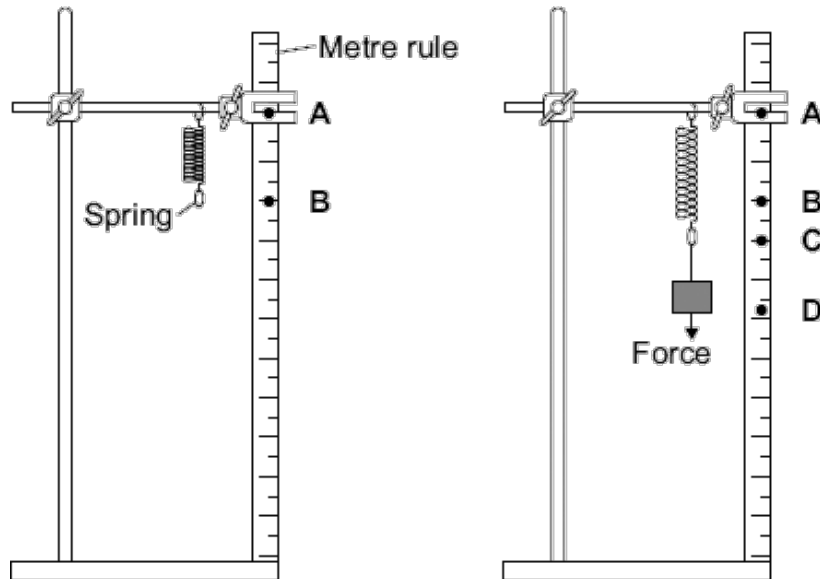
Length m

(1)

(Total 8 marks)

- Q2.** A student investigated how the extension of a spring depends on the force applied to the spring.

The diagram shows the spring before and after a force had been applied.



- (a) (i) Complete the following sentence using letters, **A**, **B**, **C** or **D**, from the diagram.

The extension of the spring is the distance between the positions labelledand on the metre rule.

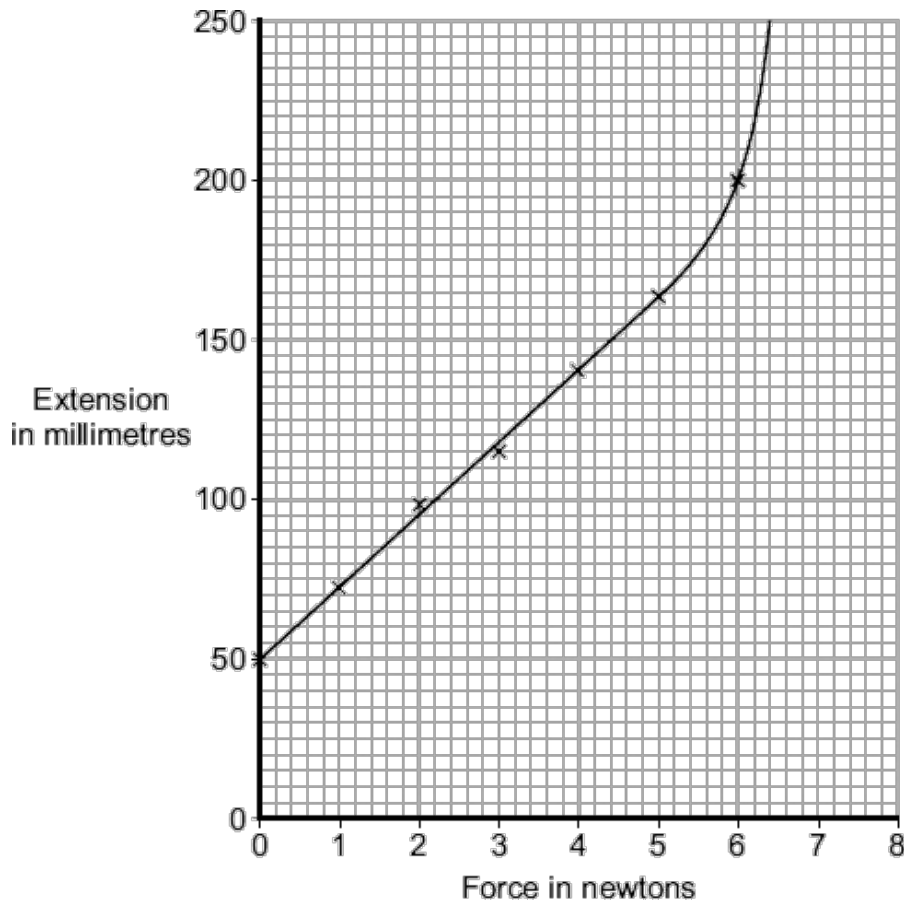
(1)

- (ii) What form of energy is stored in the stretched spring?

.....

(1)

- (b) The results from the investigation are plotted on the following graph.



- (i) The graph shows that the student has made an error throughout the investigation.

What error has the student made?

.....
.....

Give the reason for your answer.

.....
.....

(2)

- (ii) The student has loaded the spring beyond its *limit of proportionality*.

Mark on the graph line the *limit of proportionality* of the spring. Label the point **P**.

Give the reason for choosing your point **P**.

.....
.....
.....

(2)

- (c) The student uses a different spring as a spring balance. When the student hangs a stone from this spring, its extension is 72 mm.

The spring does not go past the limit of proportionality.

Calculate the force exerted by the stone on the spring.

spring constant = 25 N/m

Use the correct equation from the Physics Equations Sheet.

Show clearly how you work out your answer.

.....

.....

Force = N

(2)
(Total 8 marks)

