Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic: Forces (Low Demand Questions)

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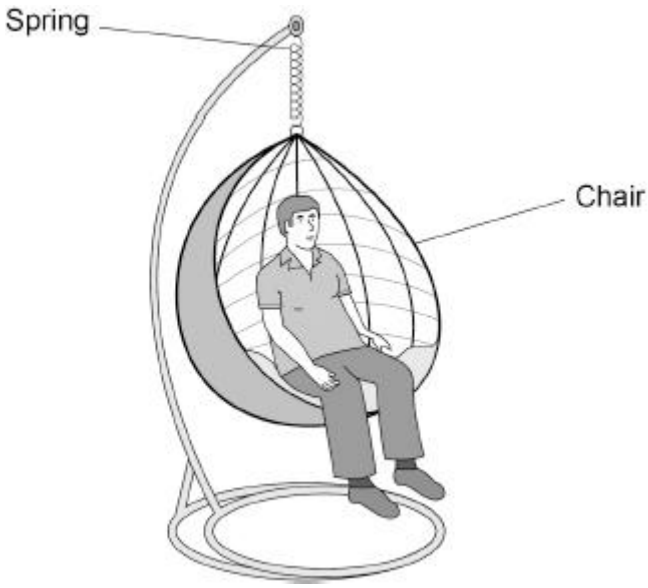
Name of the Student:_____
Max. Marks : 18 Marks **Time : 18 Minutes**

Q1.

Figure 1 shows a garden chair hanging from a spring.

Figure 1



The weight of the person causes the spring to extend.

(a) Why does the weight of the person cause the spring to extend?

Tick (✓) **one** box.

Weight acts downwards	☐
Weight acts in all directions	☐
Weight acts upwards	☐

(1)

(b) Complete the sentence.

Choose the answer from the box.

a gravitational	**a frictional**	**an electrostatic**

The weight of the person in **Figure 1** is _____ force.

(1)

The weight of the person causes an extension in the spring of 0.070 m.

The spring constant of the spring is 12 000 N/m.

(c) Calculate the weight of the person.

Use the equation:

weight = spring constant × extension

_____

_____

_____

Weight = _____ N

(2)

(d) Calculate the elastic potential energy stored in the extended spring.

Use the equation:

elastic potential energy = 0.5 × spring constant × (extension)^2

_____

_____

_____

Elastic potential energy = _____ J

(2)

(e) If there is more than one person on the chair, the spring could become inelastically deformed.

What is meant by 'inelastically deformed'?

Tick (✓) **one** box.

The spring extends more when two or more forces act on it.	☐
The spring will not go back to its original length when the force is removed.	☐
The spring extends so that it is twice as long as its original length.	☐

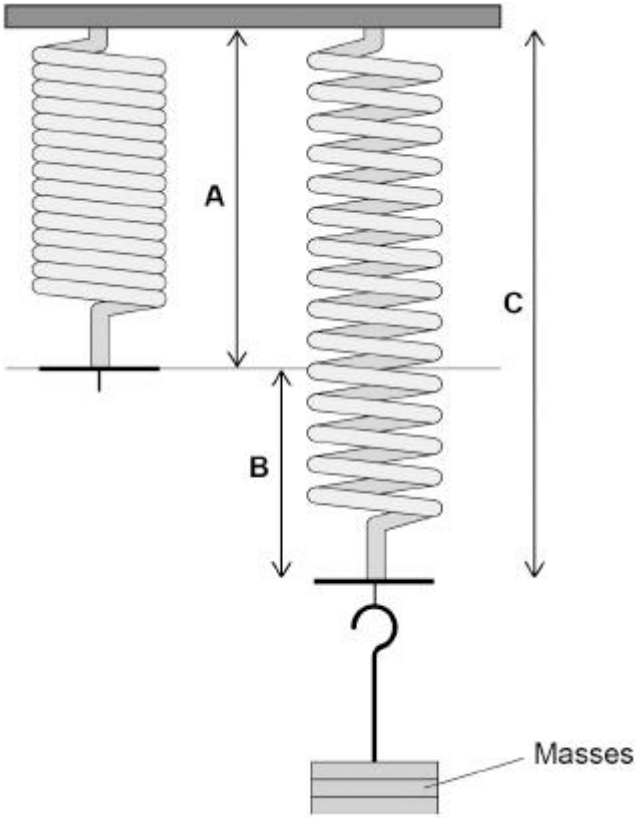
(1)

The manufacturer of the chair investigated the extension of a new spring.

(f) **Figure 2** shows slotted masses hanging from the spring.

The weight of the masses extends the spring.

Figure 2



Which length in **Figure 2** represents the extension of the spring?

Tick (✓) **one** box.

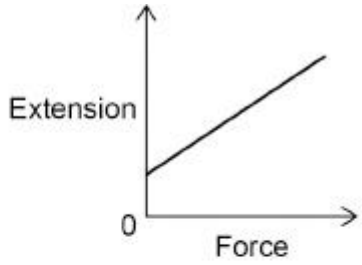
A ☐ **B** ☐ **C** ☐

(1)

(g) Which graph shows that the extension of the spring is directly proportional to the force applied to the spring?

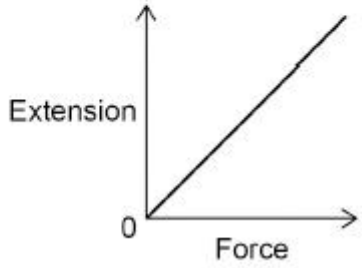
Tick (✓) **one** box.

A



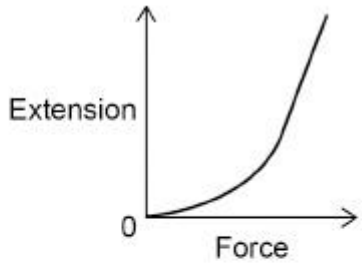
☐

B



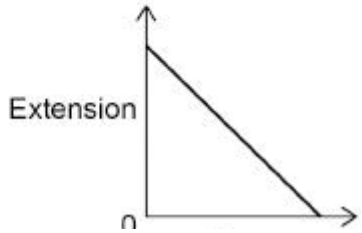
☐

C



☐

D



☐

(1)

(h) The table below shows the results of the manufacturer's investigation.

Force in newtons	Extension in metres
100	0.008
200	0.016

Suggest **two** improvements to the investigation.

1 _____

_____

2 _____

_____

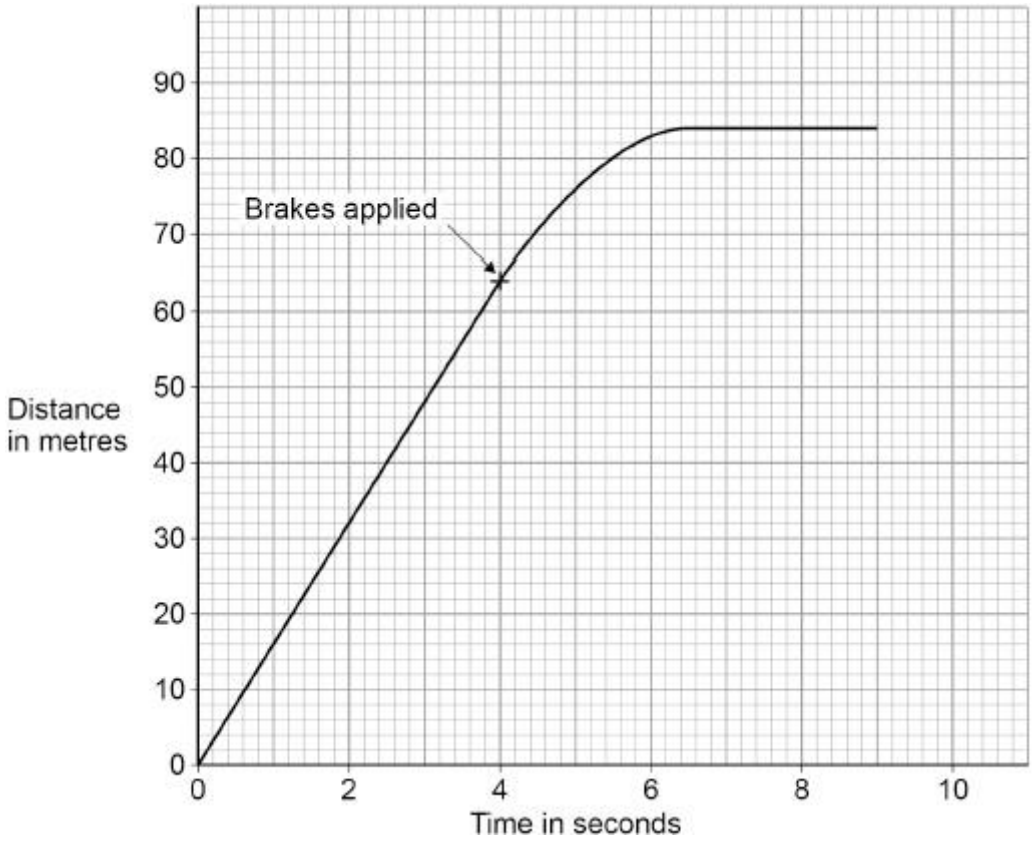
(2)

(Total 11 marks)

Q2.

A car contains a device called a black box. The black box records the distance travelled and the time taken for each journey.

The figure below shows the distance–time graph for part of a journey.



(a) Which feature of **Figure 1** shows that the car travels at a constant speed for the first 4 seconds?

Tick (✓) **one** box.

The line becomes horizontal. ☐

The line goes through the origin. ☐

The line is straight. ☐

(1)

(b) After 4 seconds the driver applied the brakes and the car slowed down and stopped.

The distance the car travelled after the brakes were applied is called the braking distance.

Determine the braking distance of the car.

Use **Figure 1**.

_____

_____

Braking distance = _____ m

(2)

The black box also records the deceleration of the car.

(c) As the car decelerates, the velocity of the car changes by 16 m/s.

The car decelerates for 2.5 seconds.

Calculate the deceleration of the car.

Use the equation:

$$\text{deceleration} = \frac{\text{change in velocity}}{\text{time taken}}$$

Deceleration = _____ m/s^2

(2)

(d) If the black box records large decelerations, it identifies that the driving may be dangerous.

Why can large decelerations be dangerous?

Tick (✓) **two** boxes.

- The brakes on the car can overheat. ☐
- The driver may lose control of the car. ☐
- The force applied by the brakes is very small. ☐
- The reaction time of the driver increases. ☐
- The thinking distance is very short. ☐

(2)

(e) The black box monitors the speed of the car.

Describe how speed affects braking distance.

(1)

(Total 8 marks)