Practice Question Set For GCSE
Subject : Physics
Paper-2 Topic :15_Forces and their matter

Name of the Student:_____
Max. Marks : 20 Marks **Time : 20 Minutes**

Q1.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Figure 3 shows a toy used to launch a ball.

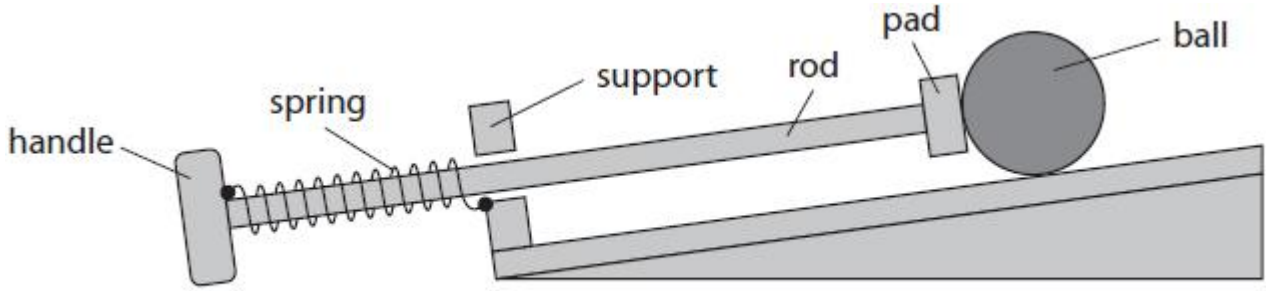

Figure 3

One end of the spring is fixed to the handle.

The other end of the spring is fixed to the support.

A child pulls the handle, stretching the spring.

Figure 4 shows the toy with the spring stretched.

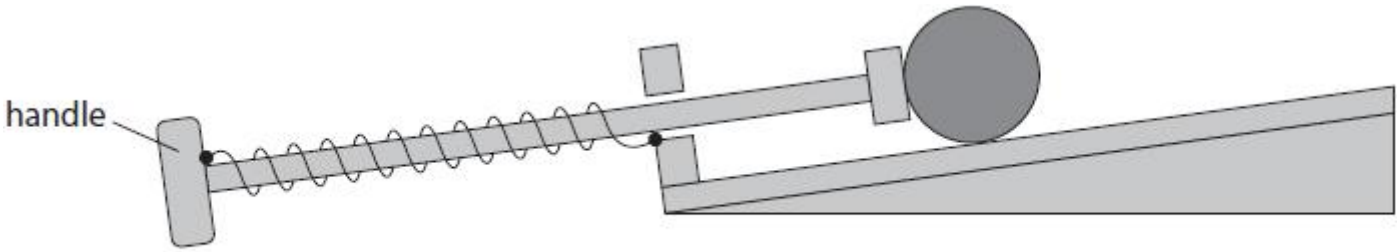

Figure 4

(i) Which of these shows the forces acting on the handle when the child keeps the spring stretched?

Ignore the force due to gravity.

(1)

☒ **A** ☒ **B** ☒ **C** ☒ **D**

(ii) In Figure 4, the extension of the spring is 0.070 m.

The spring constant (*k*) is 20 N/m.
Calculate the force used to extend the spring.
Use the equation

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force = k × extension

(2)

force = ... N

(Total for question = 3 marks)

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Q2.

Answer the questions with a cross in the boxes you think are correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Figure 1 shows an object under the surface of the sea.

(i) Which arrow shows where the pressure on the object is greatest?

(1)

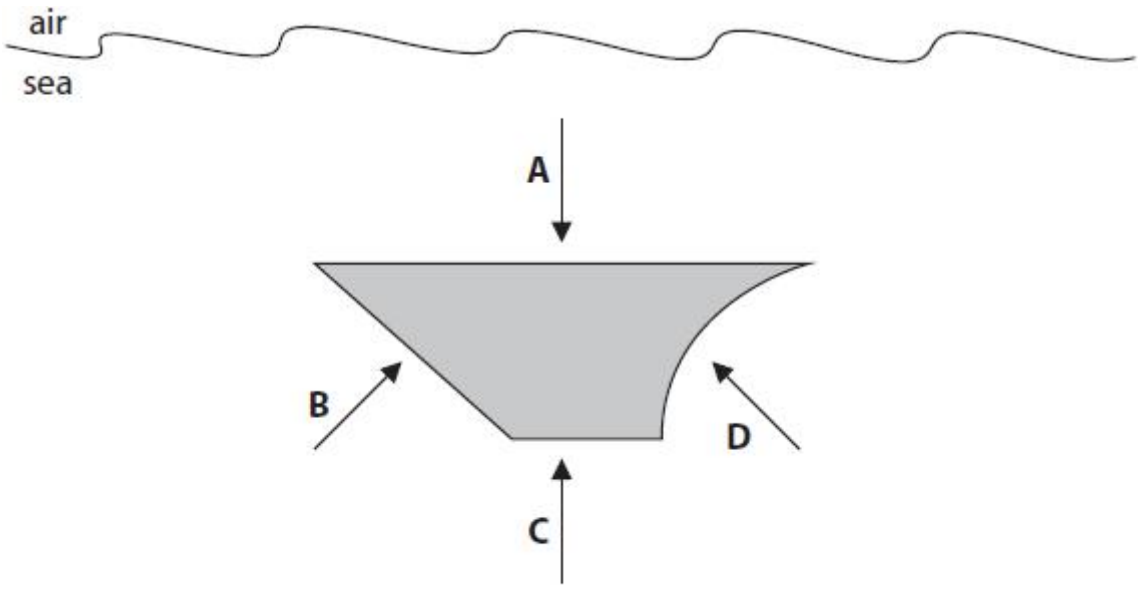

Figure 1

- ☒ **A**
- ☒ **B**
- ☒ **C**
- ☒ **D**

(ii) Figure 2 shows two blocks of stone resting on the bottom of the sea.

Both blocks have the same height.
Area Y is 4 times bigger than area X.

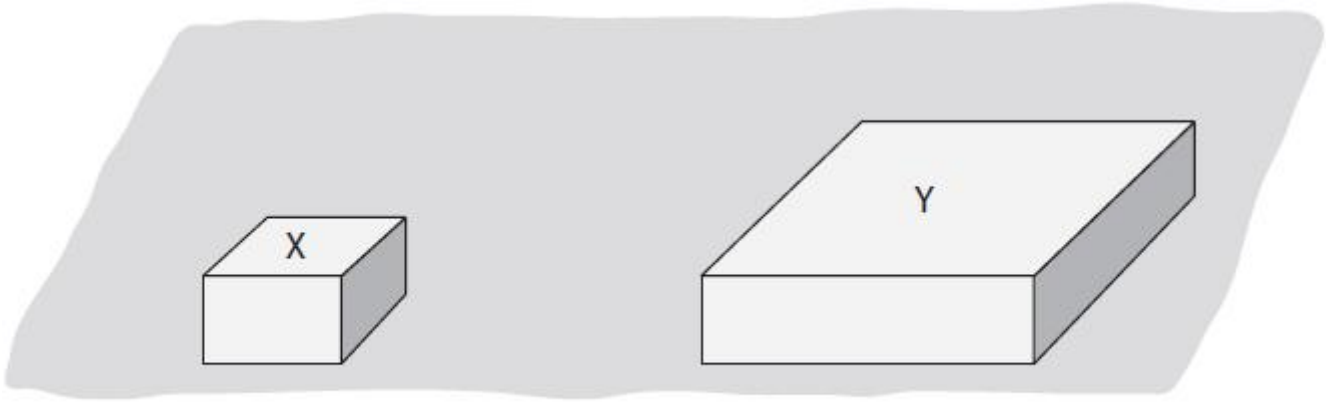

Figure 2

What is the pressure due to the water on the top surface of block Y?

(1)

- ☒ **A** one quarter of the pressure on X
- ☒ **B** the same as the pressure on X
- ☒ **C** twice the pressure on X

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☒ **D** four times the pressure on X

(Total for question = 2 marks)

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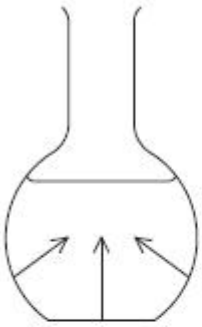
Q3.

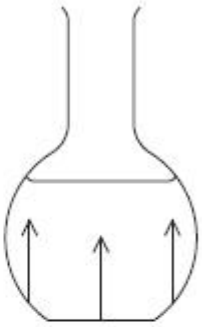
Water in a glass bottle exerts a pressure on the glass.

Which of these shows the correct directions of the pressure exerted by the water on the glass?

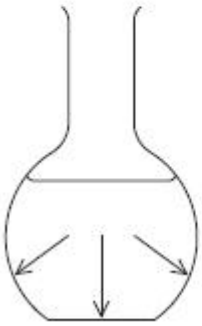
(1)



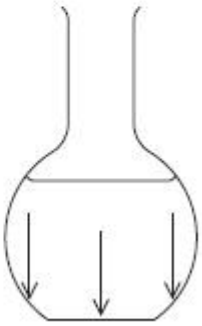
☐ **A**



☐ **B**



☐ **C**



☐ **D**

(Total for question = 1 mark)

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Q4.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Figure 16 shows a metal container with a movable piston.

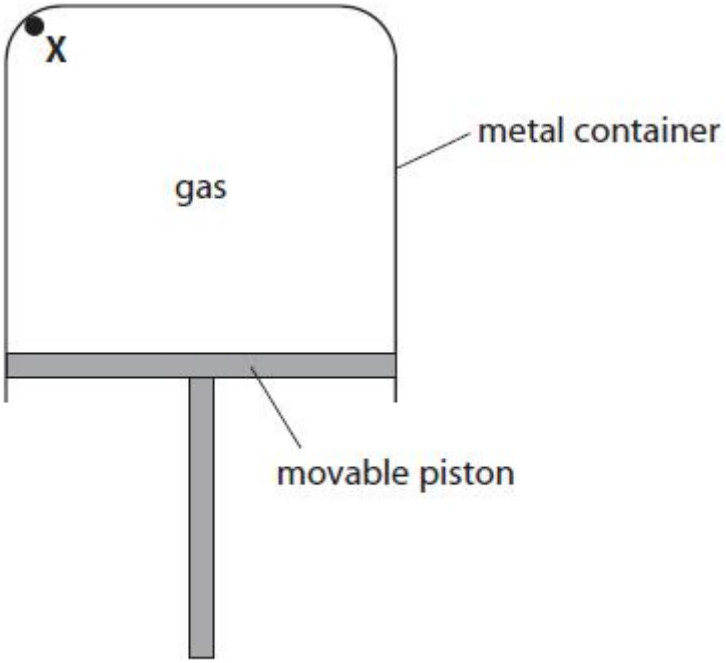


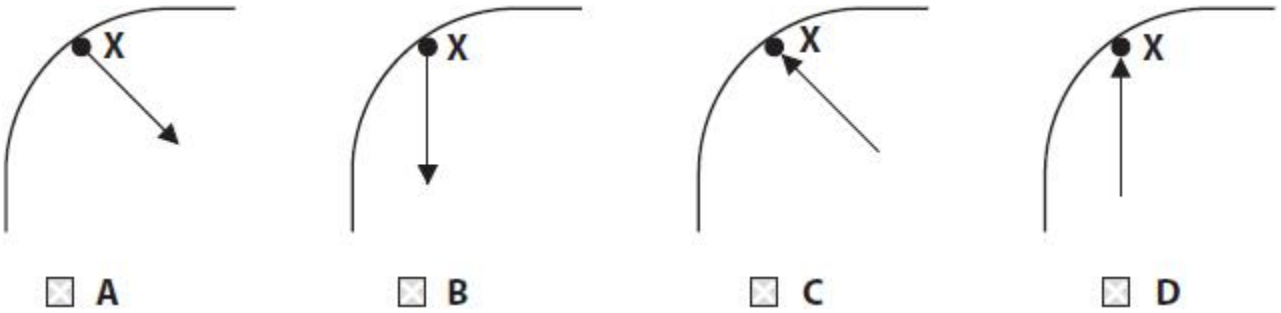
Figure 16

Point X is on the inner surface of the container.

The gas in the container is at a higher pressure than the air outside the container.

Which of these shows the direction of the force, due to the gas, on the container at point X?

(1)



☒ **A** ☒ **B** ☒ **C** ☒ **D**

(Total for question = 1 mark)

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Q5.

A student uses a digital calliper to measure the length of a spring, as shown in Figure 20.

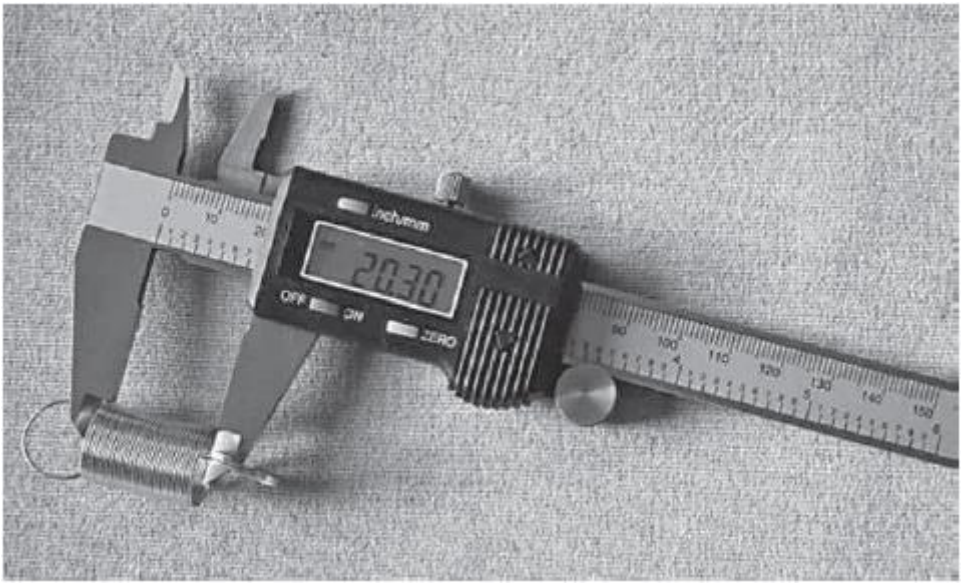

Figure 20

The spring is bendy and difficult to measure.

The student takes the six readings shown in Figure 21.

Figure 21

(a) Calculate the average length of the spring.

(2)

average length = ... mm

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(b) The student investigates the stretching of a spring with the equipment shown in Figure 22.

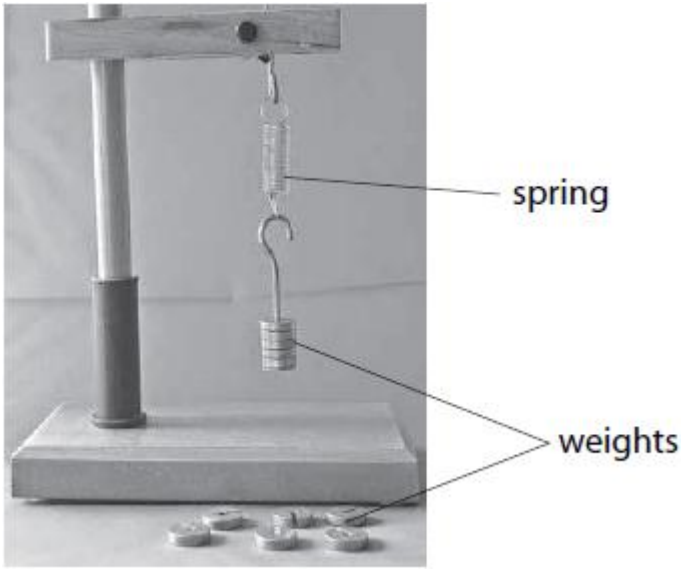

Figure 22

The student investigates the extension of the spring using six different weights.
The results are shown in Figure 23.

weight (N)	extension (mm)
0.20	4.0
0.40	8.0
0.60	12.0
0.80	16.0
1.00	20.0
1.20	24.0

Figure 23

(i) Draw a graph for the readings, using the grid shown.

(3)

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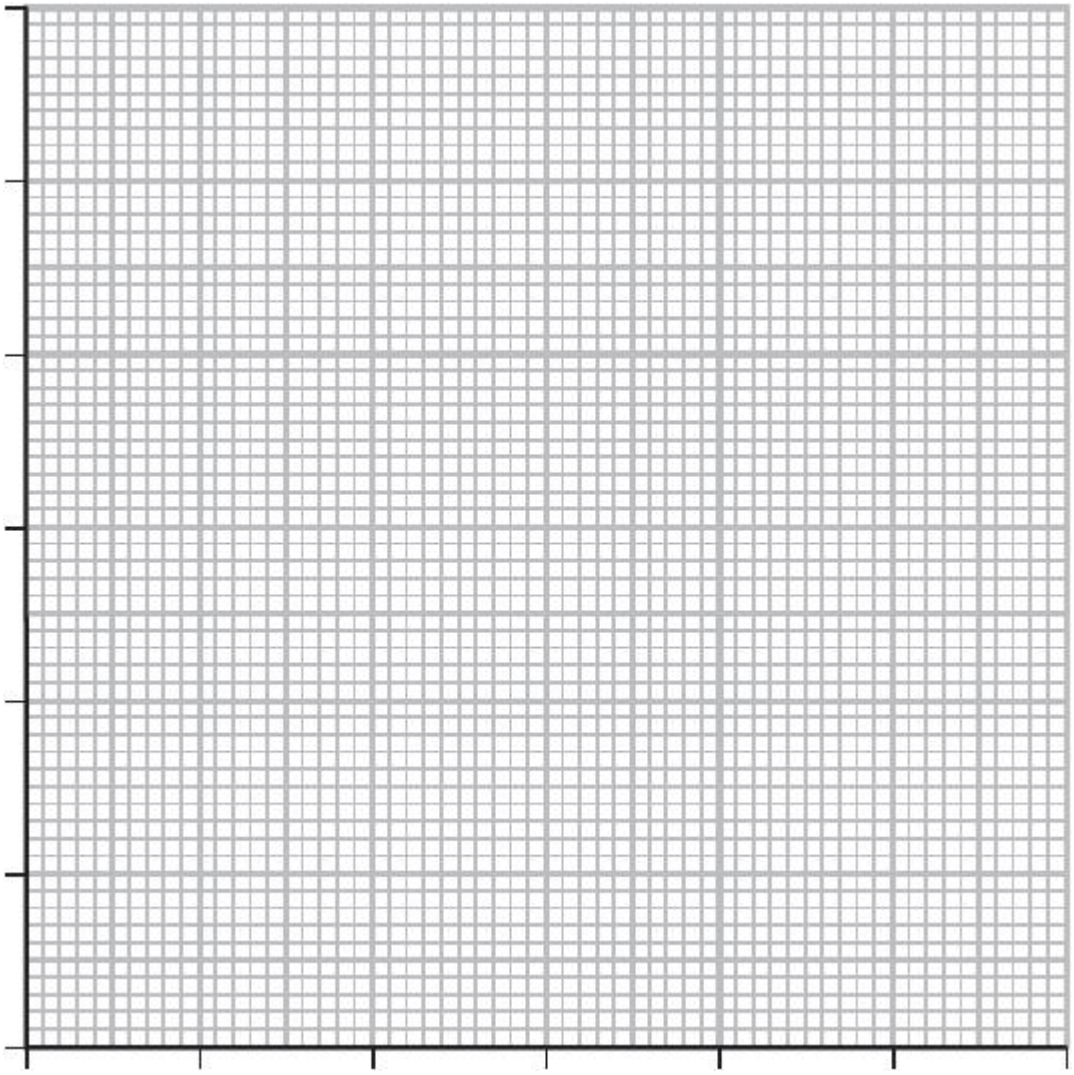

(ii) The student writes this conclusion:
'*The extension of the spring is directly proportional to the weight stretching the spring.*'
Comment on the student's conclusion.

(3)

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(Total for question = 8 marks)

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Q6.

A student uses the apparatus shown in Figure 3 to investigate the extension of a spring.

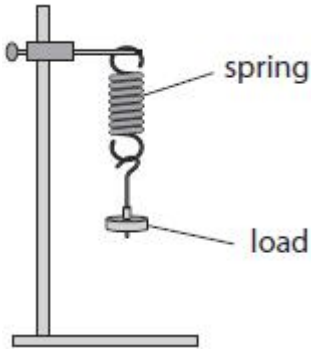

Figure 3

(i) Describe how the student could measure the extension of the spring when a load is added.

(3)

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(ii) The extension of the spring for a load of 1.5 N is 30 mm.

Calculate the spring constant for the spring.
Use the equation

$$\text{spring constant} = \frac{\text{load}}{\text{extension}}$$

(2)

spring constant = ... N/mm

(Total for question = 5 marks)

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