

Name of the Student: _____

Max. Marks : 19 Marks

Time : 19 Minutes

Q1.

A balloon is filled with helium when it is on the ground.

The balloon is released and it rises through the atmosphere.

Explain what happens to the size of the balloon as it rises through the atmosphere.

(3)

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(Total for question = 3 marks)

Q2.

Figure 25 is a graph showing how the atmospheric pressure changes with the height above sea level on the Earth's surface.

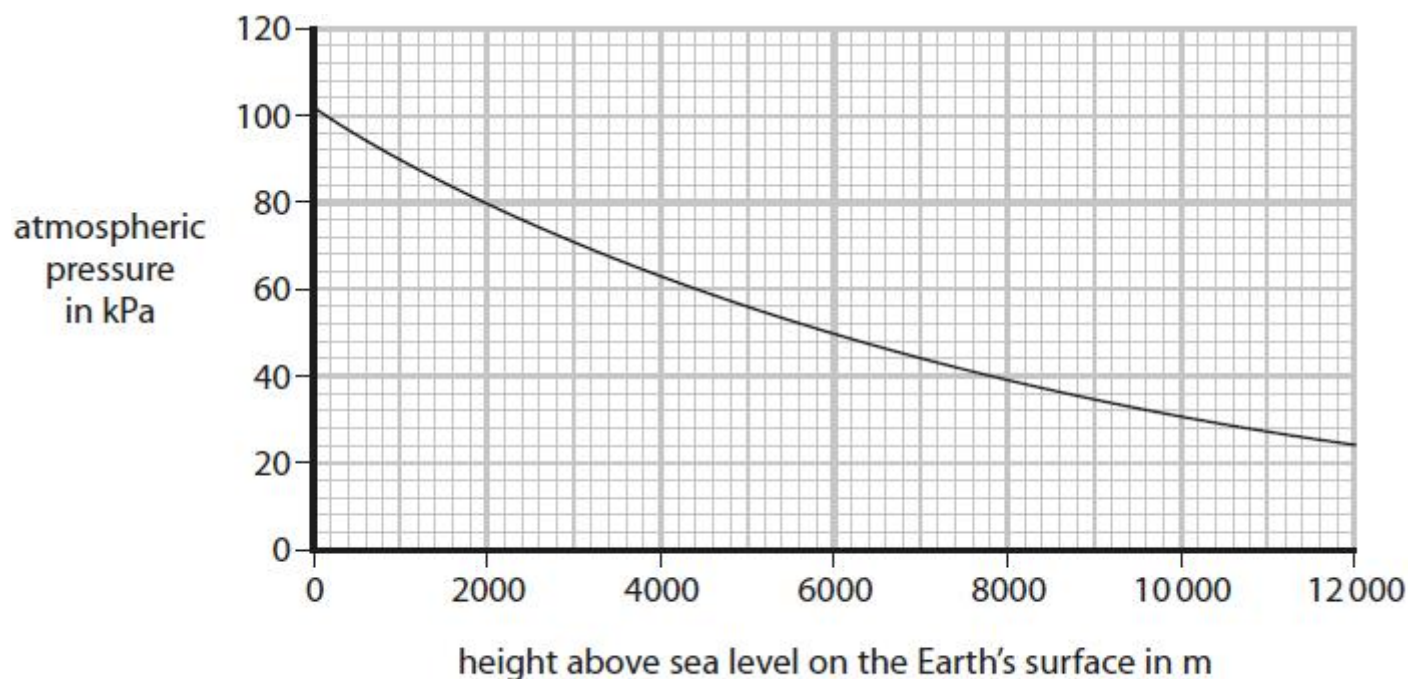


Figure 25

- (i) An aeroplane descends from 6000 m to 2000 m.

Use the graph to find the change in atmospheric pressure as the aeroplane descends.

(2)

change in pressure = kPa

- (ii) Suggest **one** reason why the atmospheric pressure is greater at 2000 m than at 6000 m.

(1)

.....
.....

(Total for question = 3 marks)

Q3.

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 diver swimming in a lake.

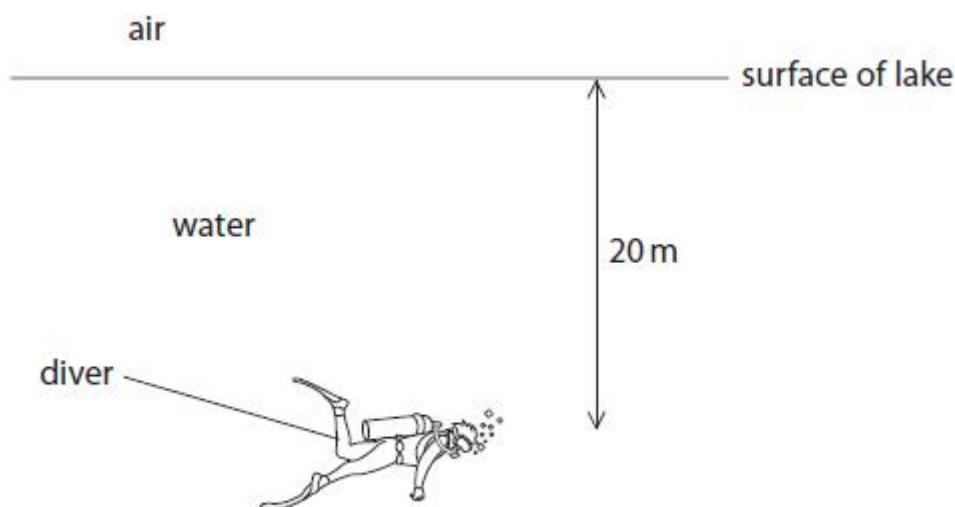


Figure 3

The pressure on the diver is due to both the water above him and the Earth's atmosphere.

The pressure of air on the surface of the water is one atmosphere. 10 m of water is equivalent to one atmosphere.

How many atmospheres of pressure will be on the diver at a depth 20 m?

(1)

- | | | |
|-------------------------------------|----------|---|
| ☒ | A | 1 |
| ☒ | B | 2 |
| ☒ | C | 3 |
| ☒ | D | 4 |

(Total for question = 1 mark)

Q4.

The student measures the extension of the spring as he adds different loads (loading).
He then measures the extension of the spring as he takes the loads off (unloading).
He then repeats the investigation using a rubber band instead of the spring.
The tables in Figure 4 show his results.

spring			rubber band		
load in N	extension in mm	extension in mm	load in N	extension in mm	extension in mm
	loading	unloading		loading	unloading
0	0	0	0	0	0
1	20	20	1	14	25
2	40	40	2	33	42
3	60	60	3	60	60

Figure 4

State **two** similarities and **two** differences between the results for the spring and the results for the rubber band.

(4)

Similarity 1

.....
.....

Similarity 2

.....
.....

Difference 1

.....
.....

Difference 2

.....
.....

(Total for question = 4 marks)

Q5.

The student measures the extension of the spring as he adds different loads (loading).
He then measures the extension of the spring as he takes the loads off (unloading).
He then repeats the investigation using a rubber band instead of the spring.
The tables in Figure 4 show his results.

spring			rubber band		
load in N	extension in mm	extension in mm	load in N	extension in mm	extension in mm
	loading	unloading		loading	unloading
0	0	0	0	0	0
1	20	20	1	14	25
2	40	40	2	33	42
3	60	60	3	60	60

Figure 4

State **two** similarities and **two** differences between the results for the spring and the results for the rubber band.

(4)

Similarity 1

.....
.....

Similarity 2

.....
.....

Difference 1

.....
.....

Difference 2

.....
.....

(Total for question = 4 marks)

Q6.

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 25 shows an object at the bottom of a beaker of water.

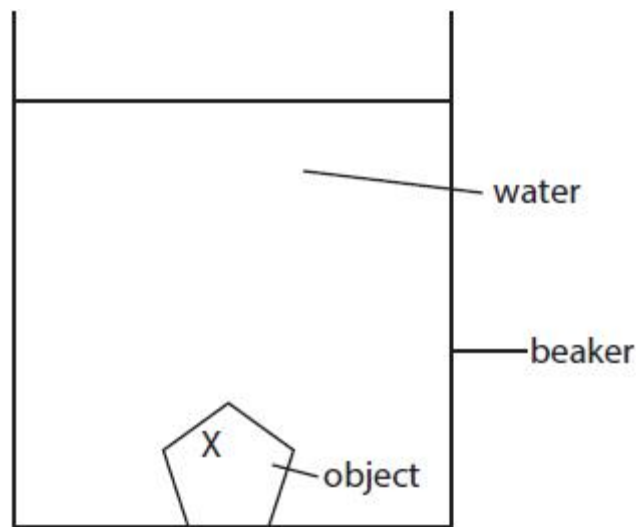


Figure 25

Which diagram shows the direction of the force exerted by the water on the object at point X?

(1)

- ☐ **A**
- ☐ **B**
- ☐ **C**
- ☐ **D**

(Total for question = 1 mark)

Q7.

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 10 shows a toy used to launch a ball.

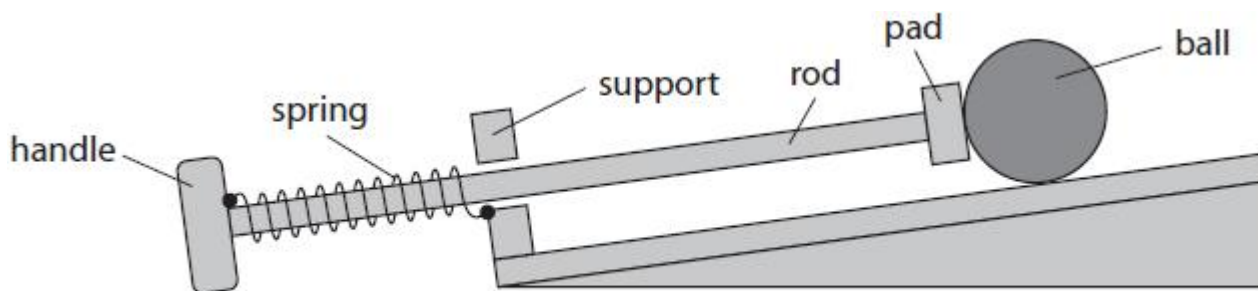


Figure 10

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 11 shows the toy with the spring stretched.

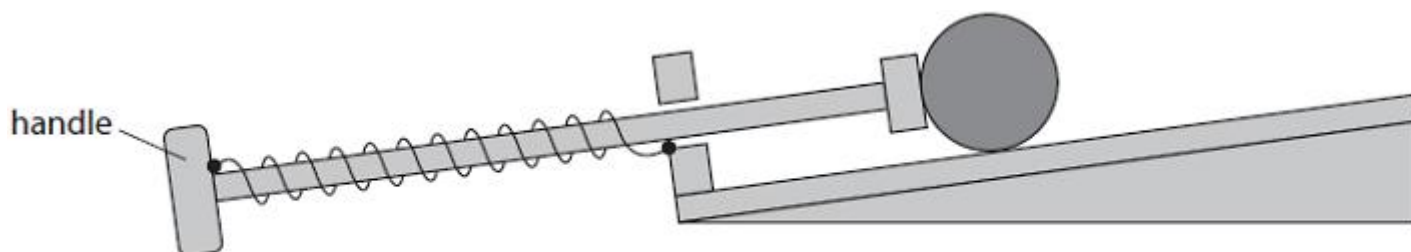


Figure 11

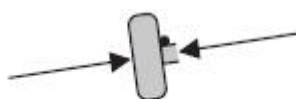
- (i) Which of these shows the forces acting on the handle when the child keeps the spring stretched?
Ignore the force due to gravity.



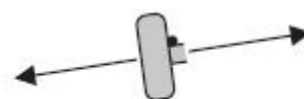
☒ A



☒ B



☒ C



☒ D

(1)

- (ii) In Figure 11, 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

$$\text{force} = k \times \text{extension}$$

(2)

force = N

(Total for question = 3 marks)