Pearson Edexcel

Additional Assessment Materials Summer 2021

Pearson Edexcel GCSE in Physics (1PH0) Foundation

Resource Set Topic H – Test 2: Particle model, Forces and Matter

Questions

(Public release version)

Pearson: helping people progress, everywhere

Pearson aspires to be the world's leading learning company. Our aim is to help everyone progress in their lives through education. We believe in every kind of learning, for all kinds of people, wherever they are in the world. We've been involved in education for over 150 years, and by working across 70 countries, in 100 languages, we have built an international reputation for our commitment to high standards and raising achievement through innovation in education. Find out more about how we can help you and your students at: www.pearson.com/uk

Additional Assessment Materials, Summer 2021

General guidance to Additional Assessment Materials for use in 2021

Context

- Additional Assessment Materials are being produced for GCSE, AS and A levels (with the exception of Art and Design).
- The Additional Assessment Materials presented in this booklet are an **optional** part of the range of evidence teachers may use when deciding on a candidate's grade.
- 2021 Additional Assessment Materials have been drawn from previous examination materials, namely past papers.
- Additional Assessment Materials have come from past papers both published (those materials available publicly) and unpublished (those currently under padlock to our centres) presented in a different format to allow teachers to adapt them for use with candidate.

Purpose

- The purpose of this resource to provide qualification-specific sets/groups of questions covering the knowledge, skills and understanding relevant to this Pearson qualification.
- This document should be used in conjunction with the mapping guidance which will map content and/or skills covered within each set of questions.
- These materials are only intended to support the summer 2021 series.

7 (a) The graph in Figure 14 shows the variation in atmospheric pressure with the height above sea level.

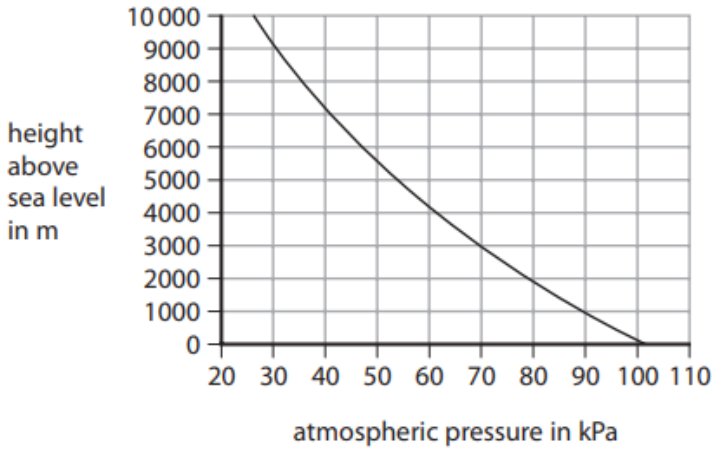

Figure 14

(i) Use the graph to estimate the atmospheric pressure at 3000 m above sea level.

(1)

atmospheric pressure = ... kPa

(ii) Use the graph to estimate the atmospheric pressure at 6000 m above sea level.

(1)

atmospheric pressure = ... kPa

(iii) Suggest a reason why the atmospheric pressure decreases with height above sea level.

(1)

.....

.....

(b) Figure 15 shows different water levels in two similar water containers with taps.

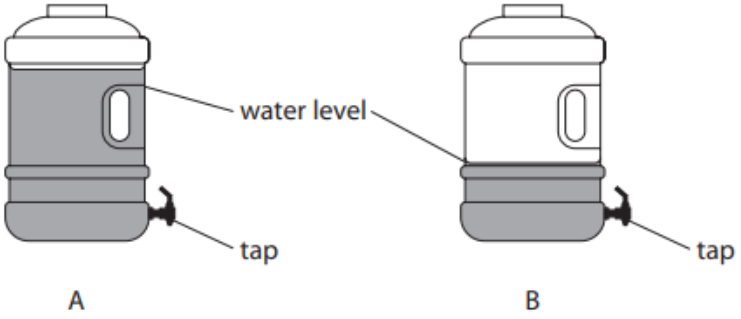

Figure 15

Explain why the water runs out of the tap of container A faster than out of the tap of container B.

(2)

.....

.....

.....

.....

(c) 10 m of sea water exerts the same pressure as the atmosphere.

A submarine is at a depth of 50 m below the surface of the sea.

Calculate how many times greater the pressure is on the submarine than atmospheric pressure.

(2)

pressure = ... times greater

*(d) Figure 16 illustrates an effect that can be explained using the ideas of pressure, force and area.

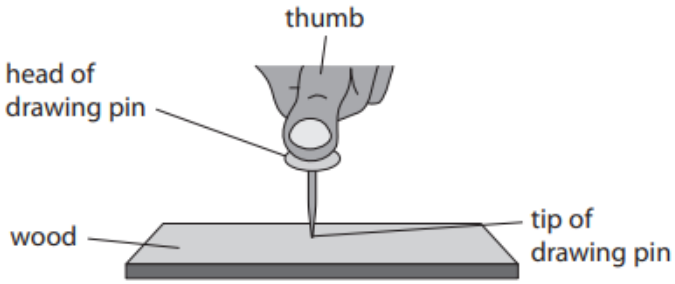

Figure 16

Explain why the tip of the drawing pin goes into the wood but the head of the drawing pin does not go into the thumb.

(6)

2 (a) Figure 3 shows a diver swimming in a lake.

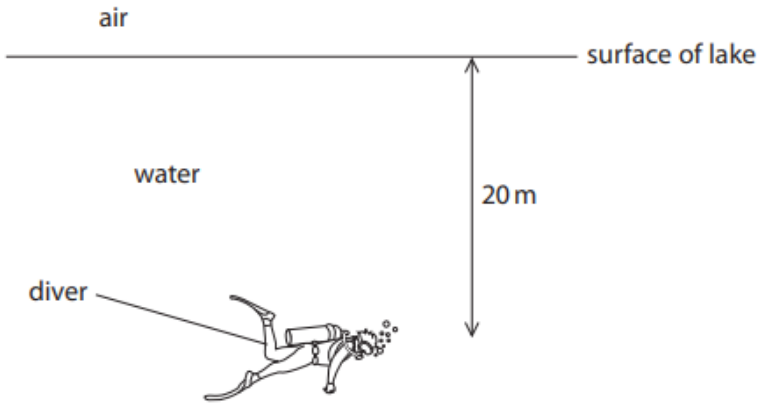

Figure 3

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

(b) 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)

(c) Figure 4 shows a container of length 6.0 m and width 2.0 m resting on a floor.
The weight of the container is 15 000 N.

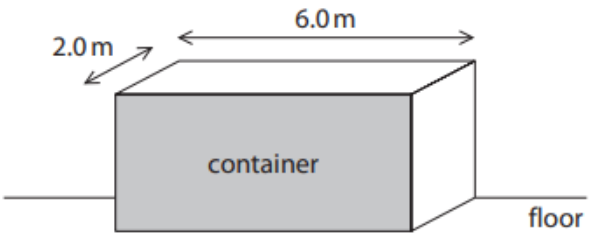

Figure 4

Calculate the pressure that the container exerts on the floor.

Use the equation

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

(3)

pressure of the container on the floor = ... Pa

5 (a) Figure 9 shows a 10 N weight hanging from a spring.

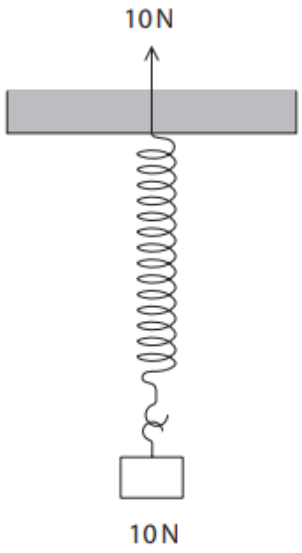

Figure 9

One of the forces acting to stretch the spring is shown in Figure 9.

Complete Figure 9 by adding an arrow to show the other force acting to stretch the spring.

(2)

(b) A weight of 4.0 N is used to extend a spring.
The extension of the spring is 0.06 m.

(i) Calculate the spring constant, *k*, of the spring.

Use the equation

$$F = k \times x$$

(3)

spring constant = ... N/m

(ii) State what measurements should be made to determine the extension of the spring produced by the 4.0 N weight.

(2)

.....

.....

.....

.....

(c) Another spring has a spring constant of 250 N/m.

Calculate the work done in stretching the spring by 0.30 m.

State the unit.

Use the equation

$$E = ½ \times k \times x^2$$

(3)

work done in stretching the spring = ... unit .....

1 (a) Figure 1 shows an object under the surface of the sea.

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

(1)

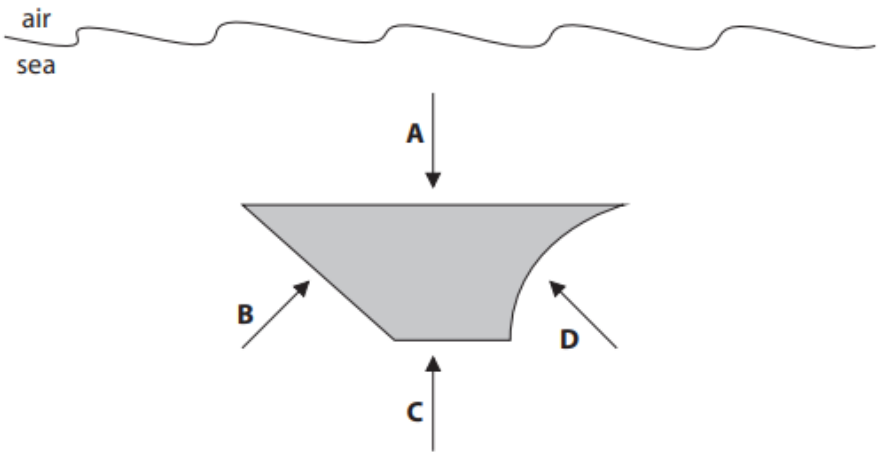

Figure 1

- ☒ **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.

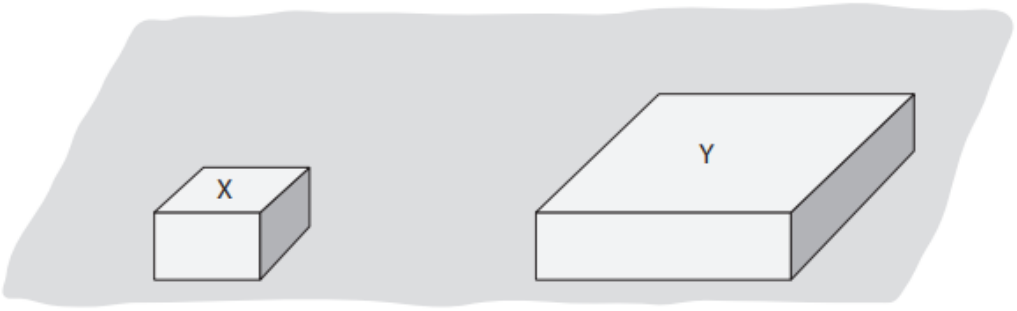

Figure 2

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
- ☐ **D** four times the pressure on X

(b) A diver is swimming underwater in a lake.

The diver wears the meter shown in Figure 3.

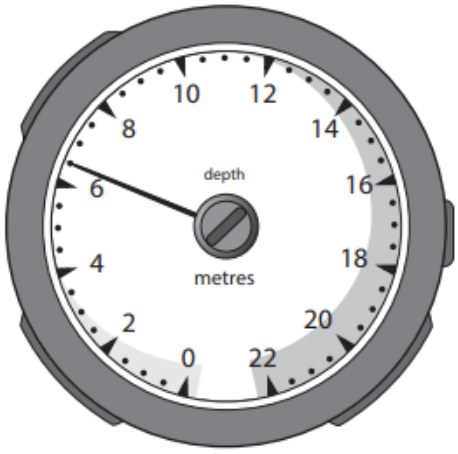

Figure 3

(i) The meter shows the depth of the diver below the surface of the water.

State the depth shown on the meter in Figure 3.

State the unit.

(2)

depth = ... unit = ...

(ii) State how the pressure of the water on the diver changes as the diver swims down from the surface of the lake.

(1)

.....

.....

(iii) State why the total pressure on the diver is greater than just the pressure due to the water above the diver.

(1)

.....

.....

(c) An aeroplane takes off from the ground.

State **two** factors that affect the pressure of the atmosphere on the aeroplane as the aeroplane goes higher in the atmosphere.

(2)

1 .....

.....

2 .....

.....

4 Figure 10 shows a toy used to launch a ball.

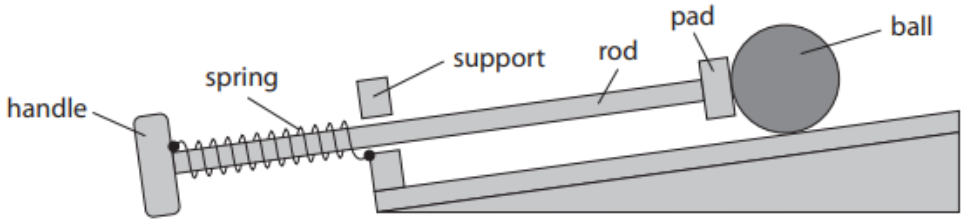

Figure 10

One end of the spring is fixed to the handle.

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

(a) A child pulls the handle, stretching the spring.

Figure 11 shows the toy with the spring stretched.

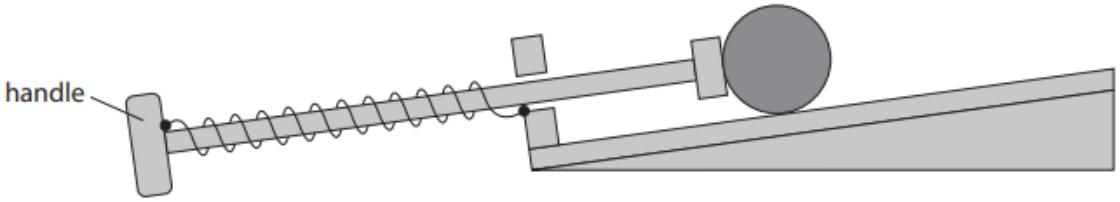

Figure 11

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

Ignore the force due to gravity.

(1)

☒ **A** ☒ **B** ☒ **C** ☒ **D**

(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

(b) The child pulls the handle until the pad is against the support as shown in Figure 12.

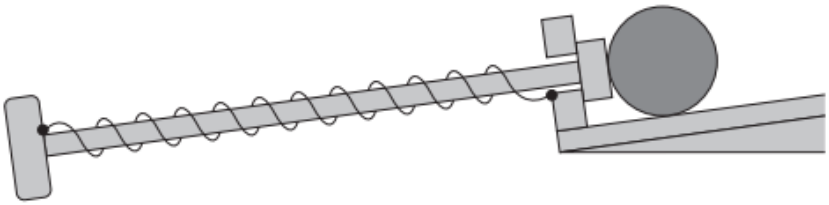

Figure 12

(i) The extension of the spring is 0.09 m.

The spring constant (k) is 20 N/m.

Calculate the work done in extending the spring by 0.09 m.

Use the equation

$$\text{work done} = \tfrac{1}{2} \times k \times (\text{extension})^2$$

(2)

work done = ... J

(ii) The child lets go of the handle.

The ball starts to move.

The spring returns to its original length.

Describe the energy transfer that takes place when the ball starts to move.

(2)

(iii) The child can only stretch the spring until the pad is pressing against the support.

Explain how the design of the toy prevents the spring from becoming damaged.

(2)

TOTAL FOR PAPER IS 47 MARKS