

CANDIDATE
NAME

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CENTRE
NUMBER

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CANDIDATE
NUMBER

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SCIENCE

1113/02

Paper 2

April 2017

45 minutes

Candidates answer on the Question Paper.

Additional Materials:

Pen
Pencil
Ruler

Calculator

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, glue or correction fluid.

DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.

You should show all your working in the booklet.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

The total number of marks for this paper is 50.

This document consists of **14** printed pages and **2** blank pages.

1 Complete the sentence.

Choose from the list.

both the south pole and the north pole

neither pole

only the north pole

only the south pole

An iron nail is attracted to of a magnet. [1]

2 This question is about sound.

Tick (✓) the correct sentence about the pitch of sound.

A high pitched sound is always loud. ☐

A high pitched sound always has a high frequency. ☐

A high pitched sound always has a large amplitude. ☐

A high pitched sound always has a low frequency. ☐

A high pitched sound must have a large wavelength. ☐

[1]

- 3 (a) Scientists classify arthropods into four main groups depending on their number of legs.

The diagrams show examples of three of these groups.

Draw straight lines to match each of the **arthropods** to its **group**.

arthropods

group



3 pairs of legs

arachnid



5 pairs of legs

crustacean



4 pairs of legs

myriapod

[3]

- (b) All arthropods have jointed legs.

Describe two **other** characteristics that would identify an arthropod.

1

2

[2]

4 Here are some chemical formulas.



(a) Choose the formulas from the list.

Each formula can be used once, more than once or not at all.

(i) Write down the formulas of **two** elements.

..... and [1]

(ii) Write down the formulas of **all** the compounds containing carbon.

..... [1]

(iii) Write down **two** formulas that show compounds made from three elements.

..... and [1]

(iv) Fertilisers are often compounds of potassium.

Write down the formula for a fertiliser that is a compound of potassium.

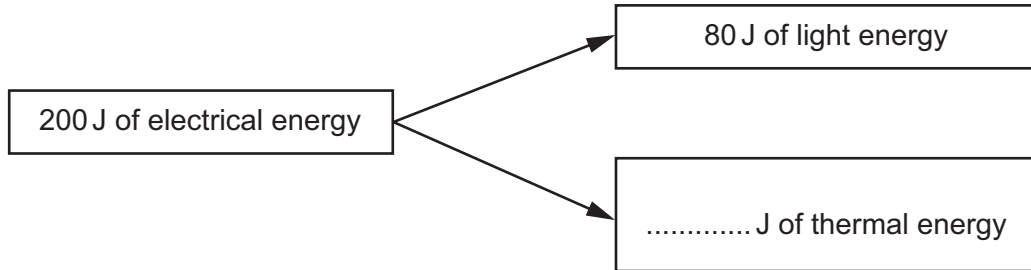
..... [1]

(b) Write down the **name** of the compound with the formula CaO .

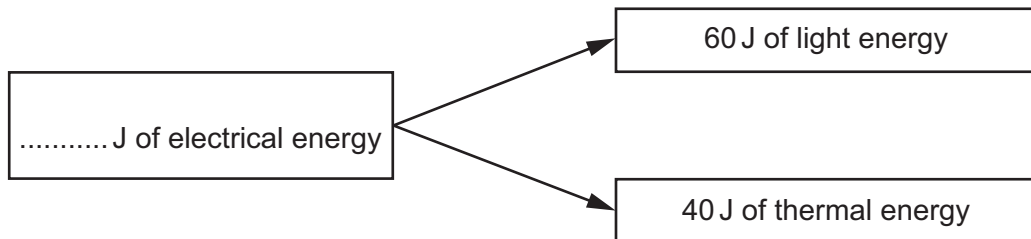
..... [1]

5 Energy is always conserved.

Complete the energy diagrams to show that energy is conserved.

(a)

[1]

(b)

[1]

- 6** The world human population needs increasing amounts of energy.

A large amount of energy is obtained by burning fuels.

- (a)** Look at the list.

Circle the fuel that is a renewable source of energy.

biomass

coal

gasoline (petrol)

natural gas

[1]

- (b)** Burning these fuels releases carbon dioxide into the environment.

- (i)** Describe some harmful effects of increasing levels of carbon dioxide on the environment.

.....

.....

.....

.....

..... [3]

- (ii)** Suggest which of these fuels would be the best to burn, if we must continue to burn fuel.

coal

gasoline (petrol)

hydrogen

wood

Explain your answer.

fuel

explanation

..... [1]

7 Look at the table of elements in Group 7 (Group 17) of the modern Periodic Table.

element	atomic mass	state at room temperature	melting point in °C	boiling point in °C
fluorine	19		−220	−188
chlorine	35	gas	−101	
bromine	80	liquid	−7	59
iodine	127	solid	114	184
astatine	210	solid	301	337

(a) Complete the sentence about the relationship between atomic mass and melting point.

As the atomic mass the melting point [1]

(b) What is the state of fluorine at room temperature?

..... [1]

(c) Estimate the boiling point of chlorine.

Choose from the list.

−201°C

−34°C

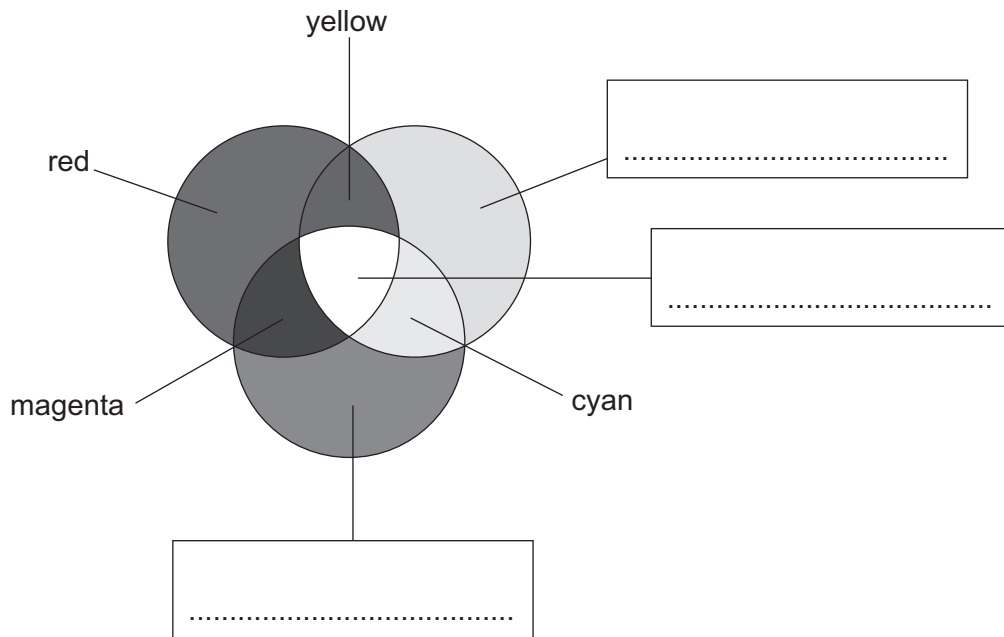
65°C

138°C

The boiling point of chlorine is °C [1]

8 Jamila uses the internet.

She finds some information about adding coloured light together.



Write the correct colours of light in the three boxes on the diagram.

[2]

9 The scientist Copernicus was born in 1473.

At this time people thought that the Earth was the centre of the universe.

What did Copernicus think was the centre of the universe?

..... [1]

10 Pierre grows pepper plants.

To find the effect of fertiliser on the growth of these pepper plants,

- he sows three groups of 50 seeds
- he places them in a glasshouse and waters one group with organic fertiliser, one with artificial fertiliser and one with distilled water
- he measures the average height of the pepper plants every 4 weeks
- he counts how many peppers each group of plants have produced after 16 weeks.

The table shows the results of his investigation.

treatment	average height of pepper plants in cm			number of peppers after 16 weeks
	4 weeks	8 weeks	12 weeks	
distilled water	38	70	98	46
organic fertiliser	42	84	124	104
artificial fertiliser	48	88	130	127

(a) (i) Which variable does Pierre **change** in his investigation?

..... [1]

(ii) State **two** variables Pierre must **control** in his investigation.

1

2 [2]

(iii) Suggest why Pierre waters one group of plants with distilled water.

..... [1]

(b) What conclusions can be made about the effects of adding fertiliser on

(i) the height of pepper plants?

..... [1]

(ii) the number of peppers the plants produced?

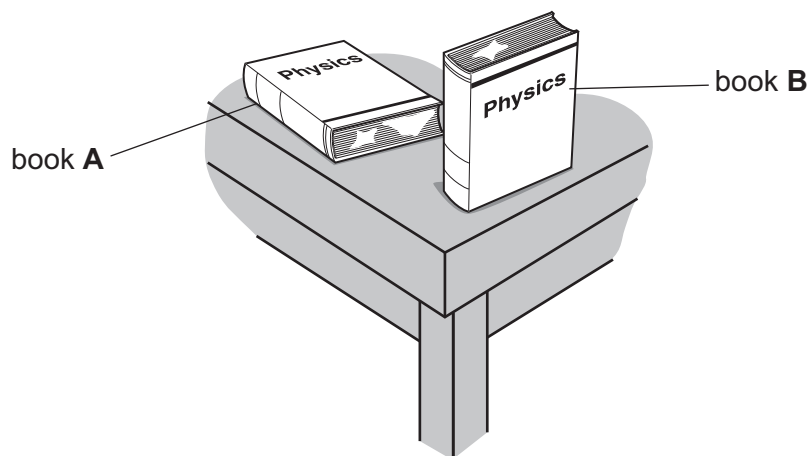
..... [1]

11 Complete the table about the reactivity of metals.

metal	reaction with cold water	reaction with dilute hydrochloric acid
sodium	violent reaction to form hydrogen
calcium	bubbles and gives hydrogen
iron	no reaction
copper	no reaction
gold	no reaction

[5]

12 Blessy puts two books on a table.



The books are the same size and the same mass.

Which book exerts the greater pressure on the table?

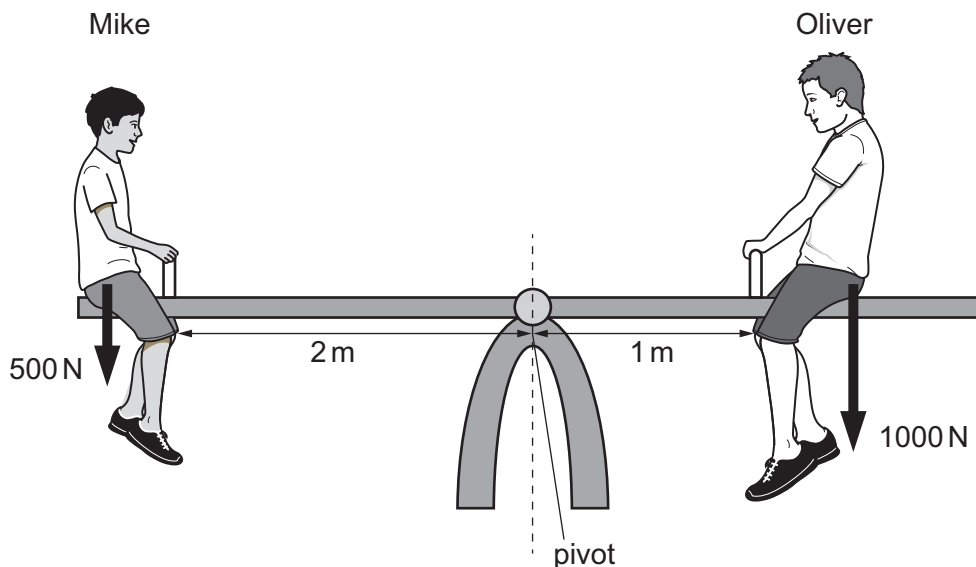
.....

Explain your answer.

.....

..... [1]

13 Mike and Oliver sit on a see-saw.



Mike is smaller than Oliver but the see-saw balances.

Explain why it balances, using the principle of moments.

.....

.....

.....

.....

..... [3]

14 Mia investigates an **endothermic** reaction.

She adds sodium carbonate to dilute ethanoic acid.

(a) The temperature of the dilute ethanoic acid at the start is 20 °C.

What will happen to the temperature when the sodium carbonate is added?

..... [1]

(b) When sodium carbonate reacts with dilute ethanoic acid a salt is made.

A gas and a liquid are also made.

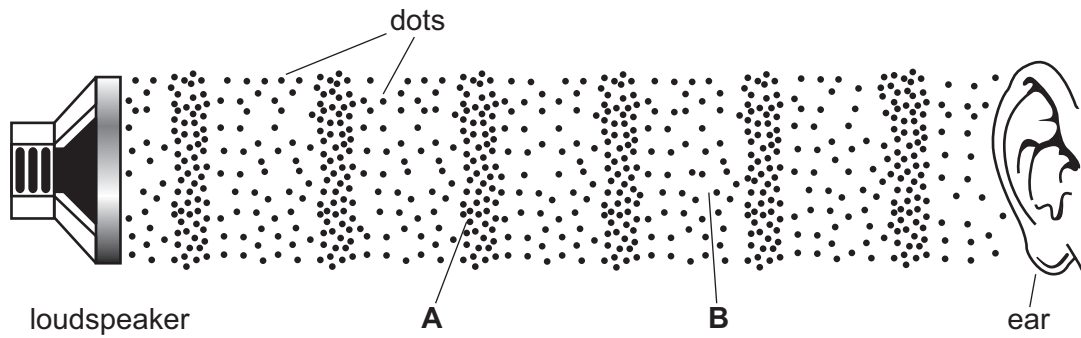
Which gas and liquid are made when carbonates react with acids?

gas

liquid

[2]

15 The properties of sound can be explained using a diagram.



(a) What do the dots represent?

Circle the correct answer.

- air particles
- heat particles
- light particles
- solid particles
- sound particles

[1]

(b) Complete the sentences.

The particles in the diagram move.

Area **A** is called a compression because the particles are

.....

Area **B** is called a rarefaction because the particles are

.....

[2]

16 Chen opens a bottle of liquid perfume.

After a few seconds he can smell the perfume.

Some of the liquid perfume evaporates into a gas.

The perfume gas then diffuses.

What happens to the particles of perfume during diffusion?

Tick (✓) the correct box.

The particles have less energy.

☐

The particles move closer together.

☐

The particles move more slowly.

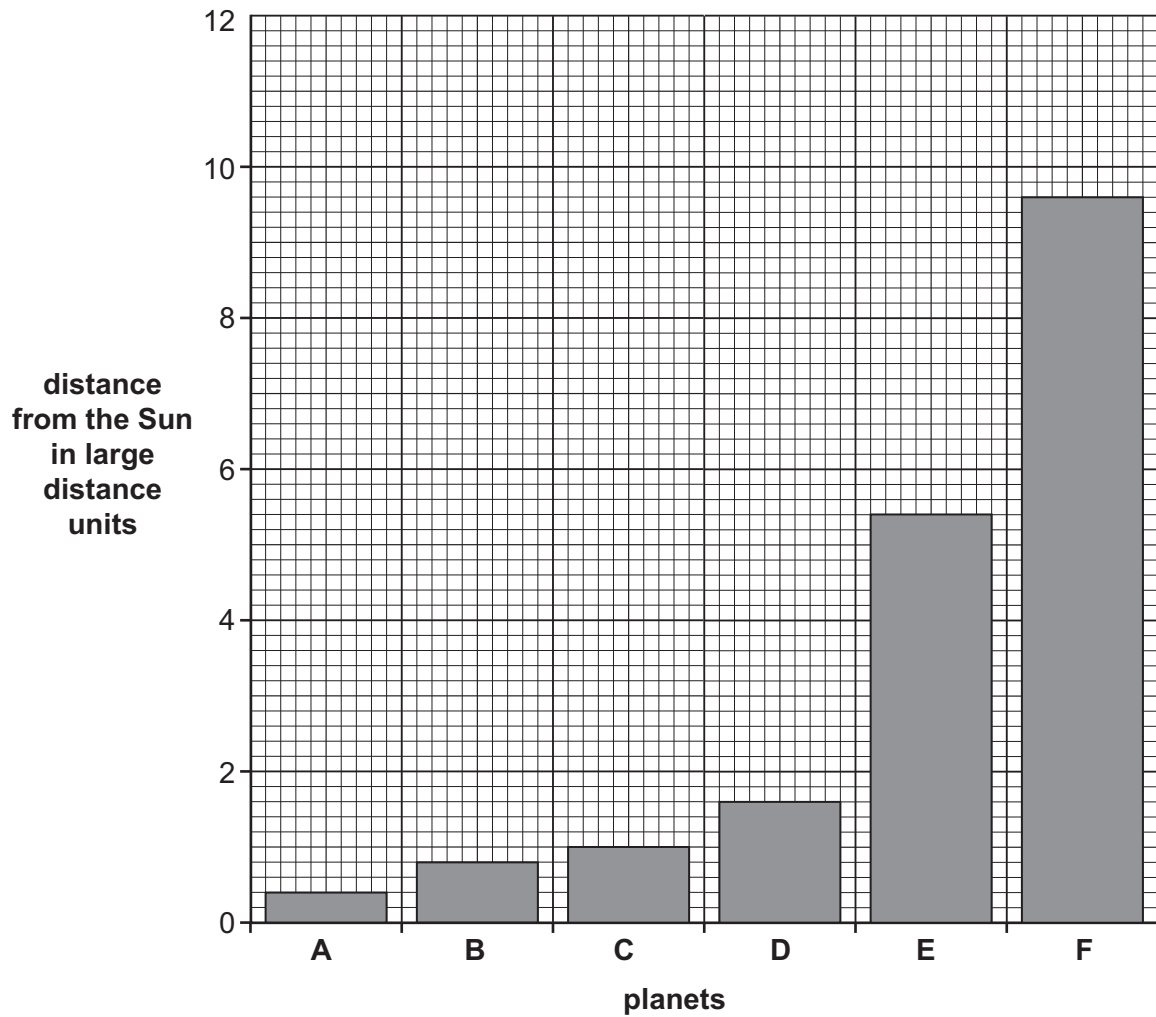
☐

The particles spread out.

☐

[1]

17 Aiko draws a bar chart to show the mean (average) distance of planets from the Sun.



(a) Planet **C** is the Earth.

What are the names of planets **A** and **B**?

Planet **A**

Planet **B** [1]

(b) What planet is between 8 and 12 large distance units from the Sun?

Choose from **A**, **B**, **C**, **D**, **E** or **F**.

..... [1]

(c) How many planets are less than 8.2 large distance units from the Sun?

Circle the correct answer.

3 **4** **5** **6** **7**

[1]

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