Cambridge Lower Secondary Checkpoint

CANDIDATE NAME

SCIENCE **1113/02**

Paper 2 **October 2021**

45 minutes

Candidates answer on the Question Paper.

Additional Materials: Pen, Pencil, Ruler, Calculator

1 This question is about cells, tissues and organs in plants and animals.

(a) Complete the table.

Tick (✓) the box that describes each part.

part of plant	cell	tissue	organ
leaf			✓
palisade mesophyll		✓	
root hair	✓		

[2]

(b) Complete the table.

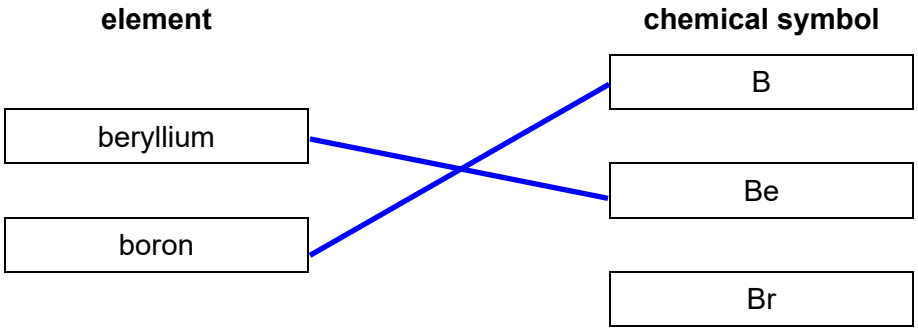
Tick (✓) the box that describes each part.

part of animal	cell	tissue	organ
sperm	✓		
stomach			✓
heart			✓

[2]

2 This question is about elements and compounds.

(a) Match the name of the **element** to its correct **chemical symbol**.



[1]

(b) Look at the formula of this compound.

NaCl

The compound contains two elements.

One element is chlorine.

Write down the name of the **other** element.

Sodium [1]

(c) Look at the formula of this compound.

CaO

What type of compound is CaO?

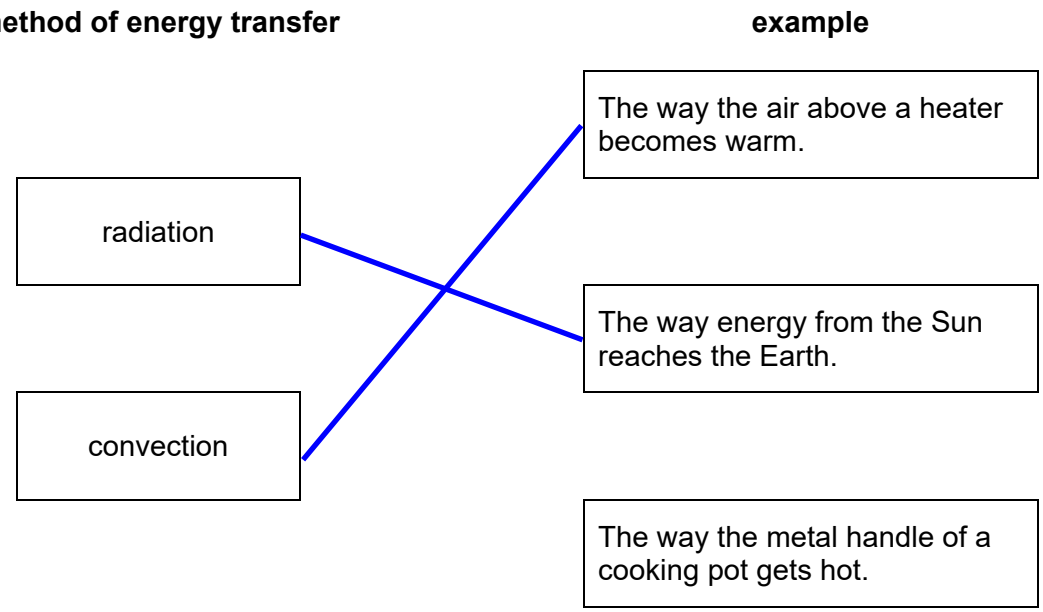
Circle the correct answer.

carbonate **hydroxide** **oxide** **sulfate**

[1]

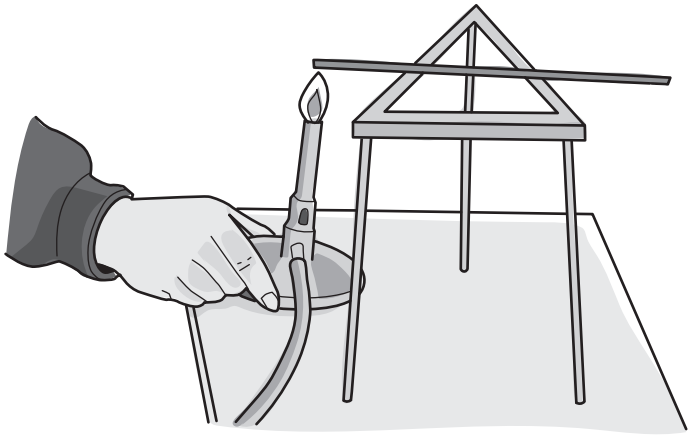
3 This question is about energy transfer processes.

(a) Draw a line from each **method of energy transfer** to its **example**.



[1]

(b) The diagram shows a copper rod being heated.



Explain how heat is transferred through the copper rod.

Use ideas about particles in your answer.

The copper particles near the burner have more energy so they will vibrate more. This causes other particles nearby vibrate more. So heat has been transferred through the copper rod

[3]

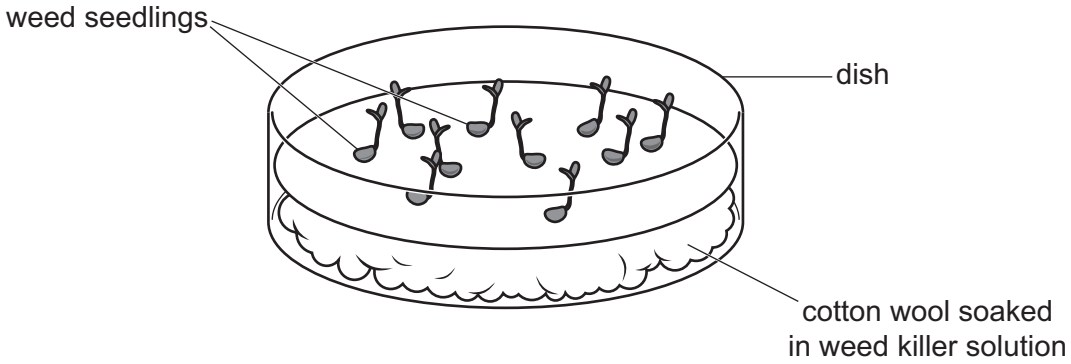
4 Weeds reduce the growth of crops.

Rajiv is testing a new weed killer to reduce the number of weeds.

He wants to find the correct concentration of weed killer to kill weed seedlings.

He uses cotton wool soaked in weed killer solution.

The cotton wool is placed in a dish containing some weed seedlings.



Rajiv does five different experiments.

In each experiment he uses a different concentration of weed killer solution.

(a) (i) State **one** variable he **changes** in each experiment.

The concentration of weed killer solution [1]

(ii) State **two** variables he **controls** in each experiment.

1 The type of weed killer solution

2 The number of weed seedlings at the beginning

[2]

(iii) State **two** variables he **measures** in each experiment.

1 The number of weed seedlings left

2 The concentration of weed killer solution

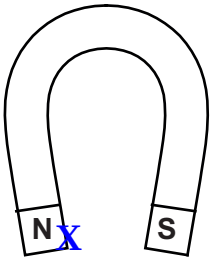
[2]

(b) Suggest why Rajiv washes his hands after handling the cotton wool soaked in weed killer.

Because weed killer can irritate skin [1]

5 Priya has two magnets.

bar magnet



horseshoe magnet

(a) Priya dips the bar magnet into iron filings.

Where will most of the iron filings stick to the magnet?

2 poles

Explain your answer.

The North and South poles are places where magnetic field is strongest

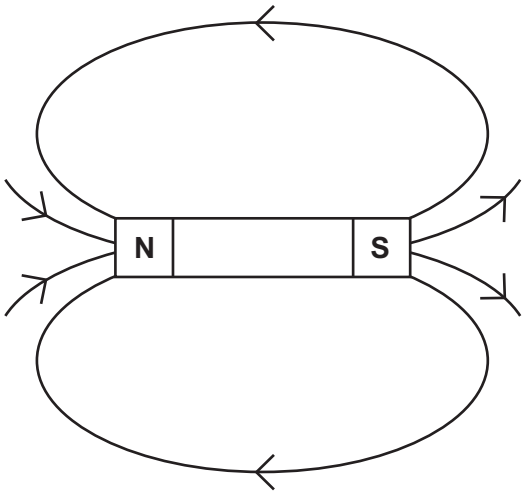
[2]

(b) Look at the horseshoe magnet.

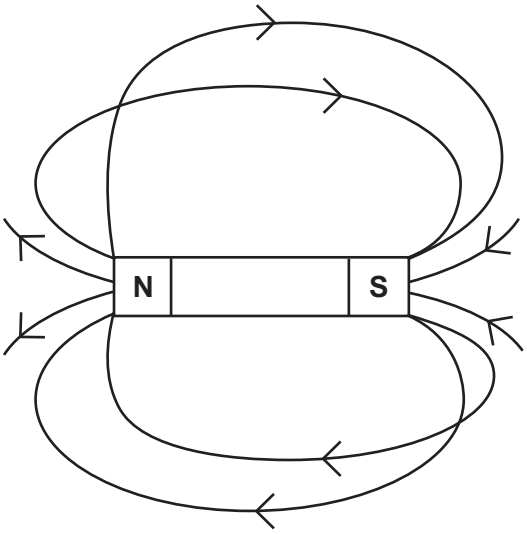
Put an **X** on the diagram to show where the **magnetic field** is **strongest**.

[1]

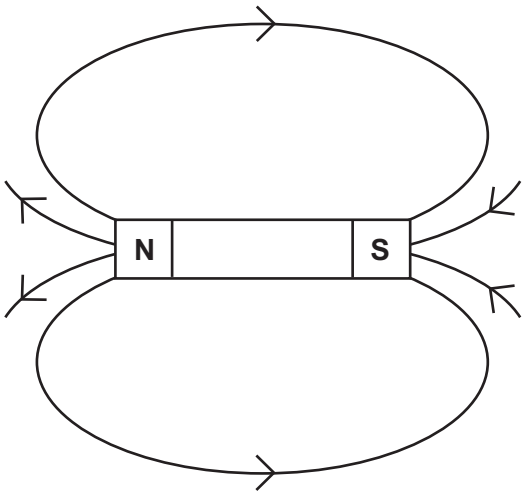
(c) Which pattern shows the magnetic field lines of a bar magnet?



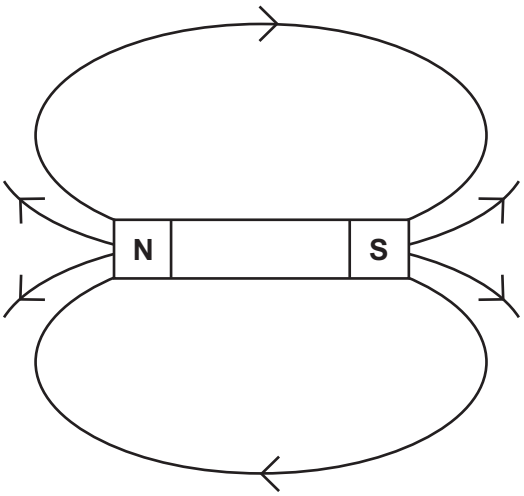
A



B



C



D

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

answer C [1]

6 Carlos investigates the pH of some liquids.

Some of the liquids are very acidic and some are very alkaline.

(a) Describe how Carlos measures the pH of the liquids.

Using pH indicator

[1]

(b) Some of the liquids are dangerous to use.

Write down **one** safety precaution Carlos takes during his investigation.

Wearing goggles

Explain why this safety precaution is needed.

The dangerous liquids can get into eyes and damage the eyes

[2]

7 Mike owns a group of sheep that he uses to produce wool.

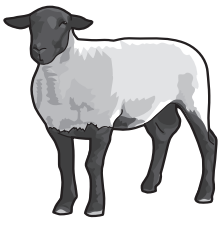
He wants to increase the amount of wool his sheep produce.

He mates his female sheep with a different variety of male sheep.

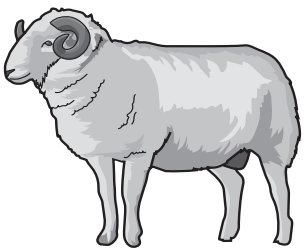
(a) What term describes this way of producing a new variety of sheep?

Artifical selection [1]

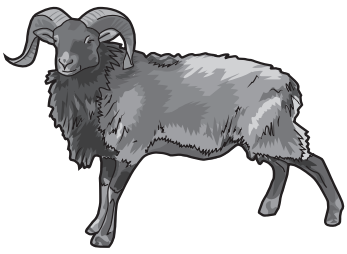
(b) The diagram shows Mike's female sheep and three different varieties of male sheep.



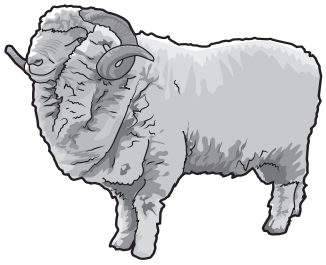
female sheep



male **A**



male **B**



male **C**

Which one of the three varieties of male sheep should Mike mate with his female sheep to increase the amount of wool his sheep produce?

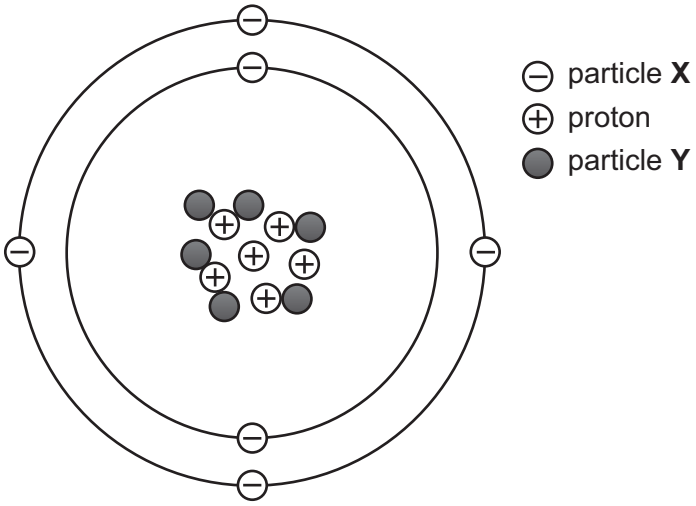
Give a reason for your answer.

variety C

reason C has the most wool

[1]

8 Look at the model of a carbon atom.



(a) Write down the name of:

particle **X** electron

particle **Y** neutron

[2]

(b) Circle the name of the scientist who suggested a model for an atom.

Copernicus **Galileo** **Newton** **Pasteur** **Rutherford** [1]

(c) The diagram shows part of the Periodic Table.

1 H							2 He
3 Li	4 Be	5 B	6 C	7 N	8 O	9 F	10 Ne
11 Na	12 Mg	13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
19 K	20 Ca						

(i) Complete the sentence.

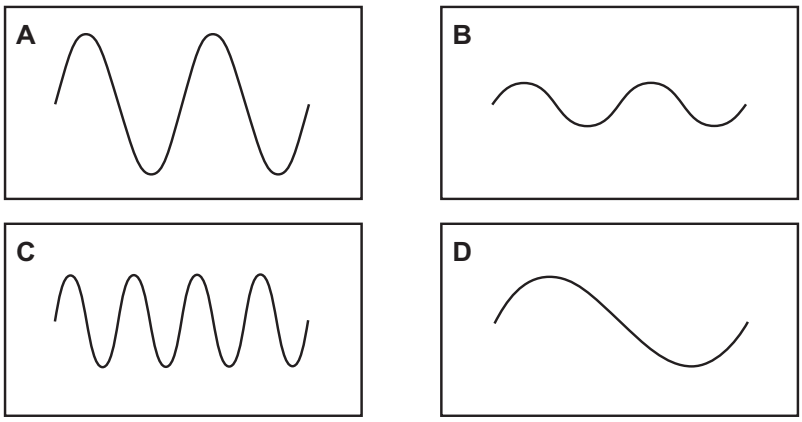
Carbon is in Period ..... 2 ..... of the Periodic Table.

[1]

(ii) Circle the element which has similar chemical properties to carbon.

Ar **Al** **B** **Li** **Si** [1]

9 Look at the diagrams of some sound waves.



You can use each letter once, more than once, or not at all.

(a) Which wave has the **highest frequency**? ..... C ..... [1]

(b) Which wave shows the **quietest sound**? ..... B ..... [1]

(c) Which wave shows the **lowest pitch**? ..... D ..... [1]

(d) Which **two** waves have the **same amplitude ?** ..... C ..... and ..... D ..... [1]

10 During breathing, air passes into the alveoli (air sacs) of the lungs, and is then released back into the atmosphere.

Look at the table.

It shows the composition of inhaled air (air we breathe in) and exhaled air (air we breathe out).

gas	percentage in inhaled air	percentage in exhaled air
carbon dioxide	0.04	4
nitrogen and other gases	80	80
oxygen	20	16

(a) Describe the differences between the composition of inhaled air and exhaled air.

Exhaled air has more percentage of carbon dioxide than inhaled air

Exhaled air has less percentage of oxygen than inhaled air

[2]

(b) Explain what happens in the alveoli to cause these differences between inhaled and exhaled air.

Carbon dioxide diffuses out of the blood

Oxygen diffuses in to the blood

[2]

(c) Air enters the human respiratory system through the nose and nasal cavity.

Write down **two other** parts that inhaled air moves through before it reaches the alveoli.

trachea and bronchus [1]

11 The table describes the reaction of some metals with cold dilute acid and cold water.

metal	reaction with cold dilute acid	reaction with cold water
potassium	reacts violently	reacts very rapidly
lithium	reacts violently	reacts very rapidly
calcium	reacts violently	reacts very rapidly
magnesium	reacts rapidly	extremely slow reaction
metal **X**	reacts slowly	no reaction
copper	no reaction	no reaction
gold	no reaction	no reaction

Use information from the table to answer these questions.

(a) Explain how you can tell that magnesium reacts faster with cold dilute acid than with cold water.

Because magnesium reacts rapidly with cold dilute acid and extremely reacts with cold water [1]

(b) Suggest the name of metal **X**.

Iron [1]

(c) Potassium reacts with cold water to make a colourless gas and an alkaline solution.

Write the name of the: $K + H_2O \rightarrow KOH + H_2$

colourless gas hydrogen

alkaline solution potassium hydroxide

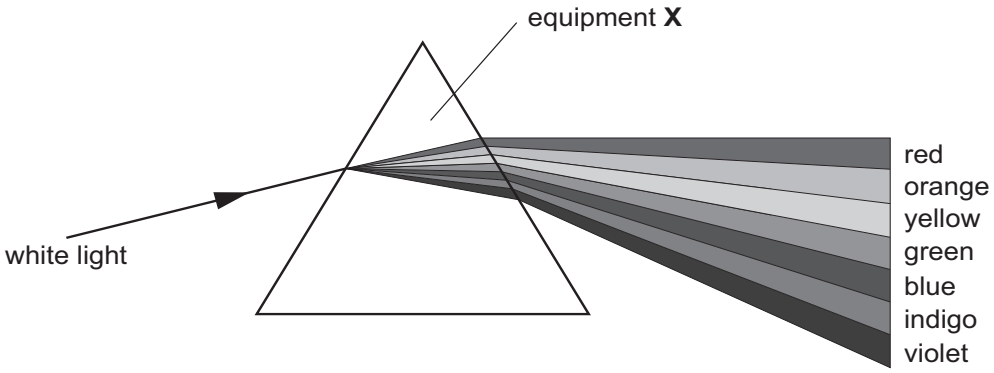
[2]

12 Complete the table to show the colour each object appears in different colours of light.

colour of light	colour of object	colour the object appears
white	red	red
green	green	green
blue	red	black

[2]

13 Blessy uses pure white light to produce a spectrum of colours.



(a) What is the name of the process that splits white light into a spectrum of colours?

Dispersion [1]

(b) Write down the name of equipment **X**.

Prism [1]

14 Look at the list of energy sources.

Tick (✓) the **two** renewable energy sources.

coal	☐
hydroelectric	✓
oil	☐
natural gas	☐
solar	✓

[2]