

CANDIDATE  
NAME

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CENTRE  
NUMBER

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CANDIDATE  
NUMBER

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SCIENCE

1113/02

Paper 2

April 2016

45 minutes

Candidates answer on the Question Paper.

Additional Materials: Pen Calculator  
Pencil  
Ruler

**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.**

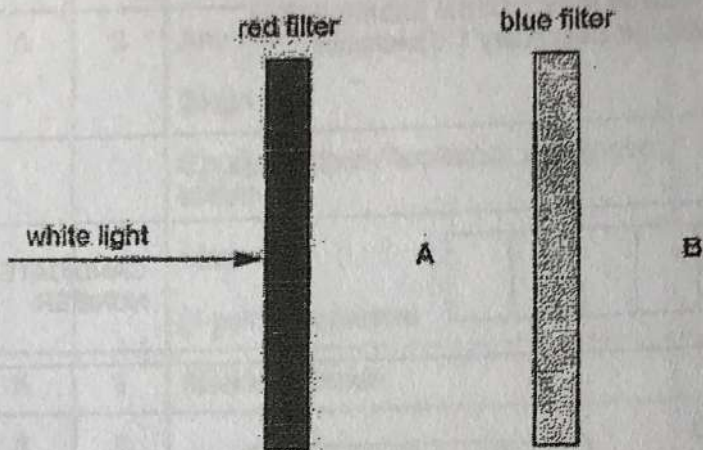
Answer all questions.  
You should show all your working in the booklet.

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 18 printed pages and 2 blank pages.

1 Chen investigates light and coloured filters.

He shines white light through a red filter and then a blue filter.



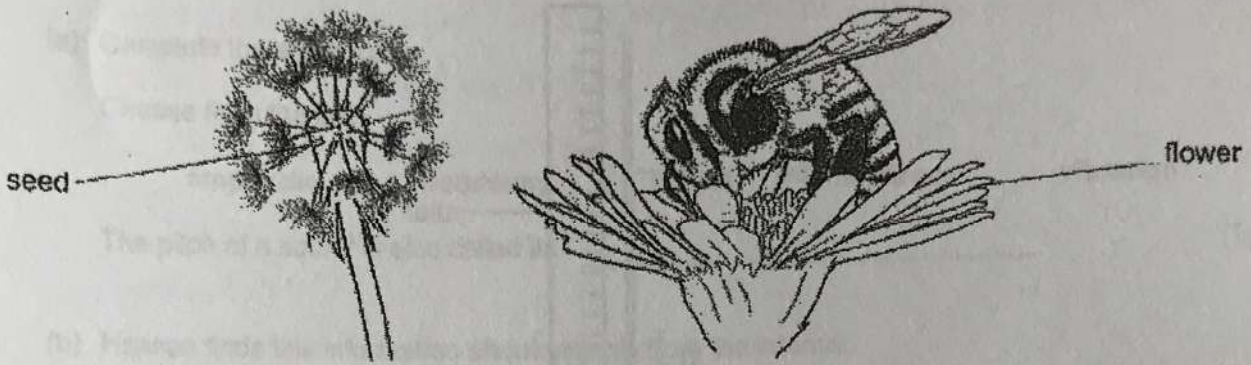
What is the colour of the light at A and at B?

A .....

B .....

[2]

2 The drawing shows parts of a dandelion plant.



(a) Bees are attracted to dandelion flowers and they pollinate them.

(i) What attracts bees to dandelion flowers?

..... [1]

(ii) Explain what is meant by pollination.

.....  
..... [2]

(b) Dandelion seeds must be dispersed away from the parent plant.

(i) Why do seeds need to be dispersed away from the parent plant?

..... [1]

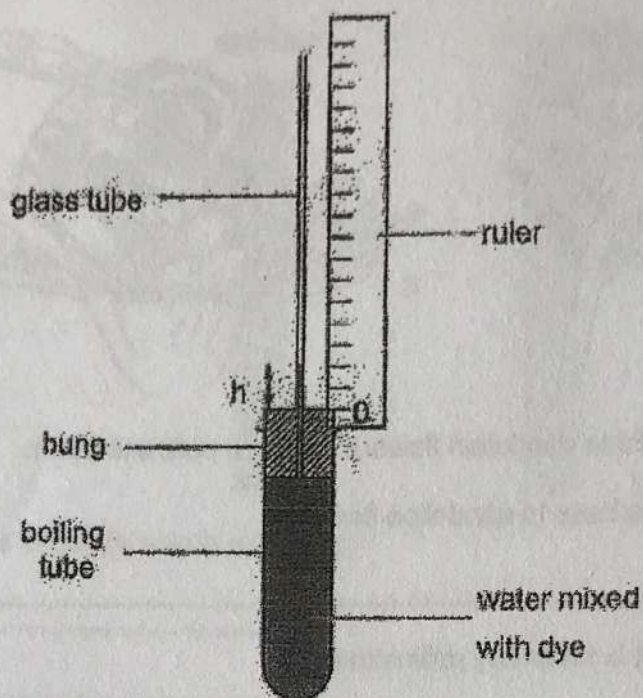
(ii) Use the information given in the drawing to suggest how these seeds are dispersed.

Give a reason for your answer.

method of dispersal .....  
reason ..... [2]

3 Mia makes a thermometer.

Look at the apparatus she uses.



(a) Mia measures the height,  $h$ , of the liquid in the glass tube.

Mia then places the boiling tube into a beaker of water and ice.

(i) What happens to the height of the liquid in the glass tube?

..... [1]

(ii) Describe how the movement and arrangement of water particles change as the water gets colder.

.....  
 ..... [2]

(b) Mia decides to test her thermometer in boiling water.

(i) Describe one safety precaution she needs to take to prevent injury.

..... [1]

(ii) How does this safety precaution help prevent injury?

..... [1]

4 Animals can hear sounds of different pitches.

(a) Complete the sentence.

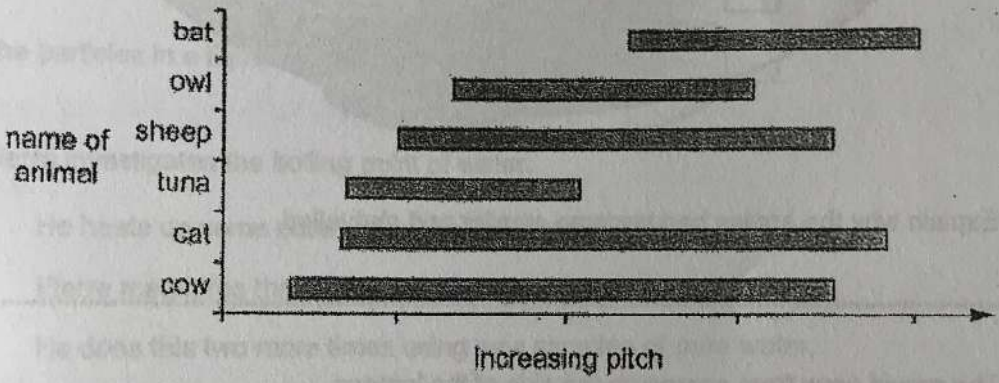
Choose from the list.

- amplitude
- frequency
- height
- loudness
- vibration

The pitch of a sound is also called its ..... [1]

(b) Hassan finds this information about animals from the internet.

It shows the range of hearing of different animals.



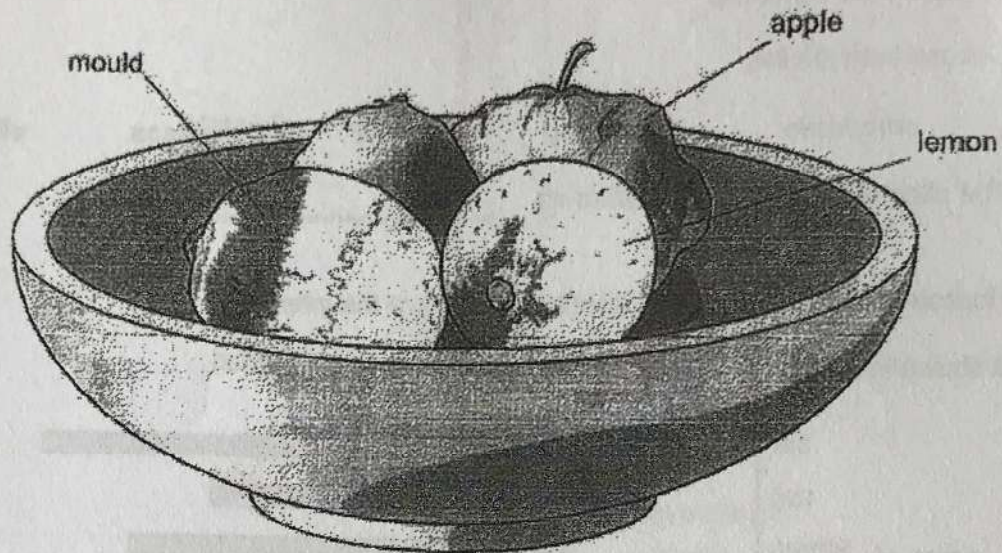
The cat has a large range of hearing.

Which animal has the **smallest** range of hearing?

Choose from the graph.

..... [1]

- 5 Lily bought some fresh apples and lemons and placed them in a bowl near the kitchen window. A few days later, Lily's apples had turned brown and were smaller and shrivelled. The lemons had green mould growing on them.



- (a) Explain why the apples had become smaller and shrivelled.

..... [1]

- (b) The mould grew from spores on the skin of the lemons.

Suggest where these spores came from and how they got onto the lemon.

.....  
 ..... [2]

- (c) The apples and lemons in Lily's fridge still looked fresh even though they were bought at the same time.

Suggest two reasons why.

1 .....  
 2 ..... [2]

6 This question is about liquids.

(a) When a liquid is put into a beaker it takes on the shape of the beaker.

Why do liquids take on the shape of the beaker?

Tick (✓) the boxes next to two correct answers.

Liquids have no fixed shape.

Liquids have no fixed volume.

Liquid particles only vibrate.

The particles in a liquid expand.

The particles in a liquid move around.

[2]

(b) Pierre investigates the boiling point of water.

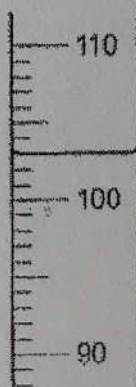
- He heats up some pure water in a beaker until it boils.
- Pierre measures the boiling point of the pure water.
- He does this two more times using new samples of pure water.
- Pierre then does this three more times using salt water.

The table shows some of his results.

type of water	boiling point in °C		
pure water	100	100	100
salt water	102	103	

(i) There is one result missing.

The thermometer shows Pierre's missing result.

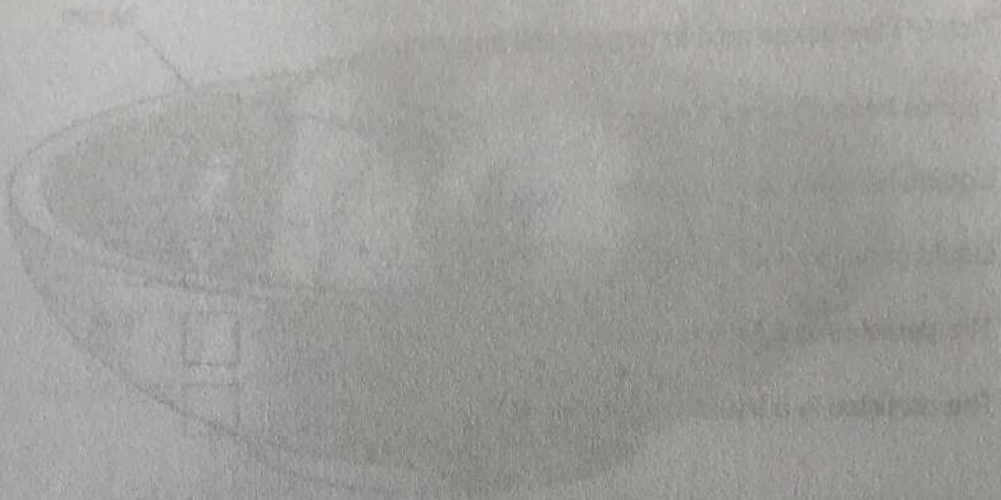


What is the temperature on the thermometer? ..... °C

[1]

(II) What effect does adding salt have on the boiling point of water?

[1]



- (a) Explain why the boiling point of water increases when salt is added.
- (b) Suggest why the boiling point of water does not increase when sugar is added.

Substance	Boiling Point (°C)
Pure water	100
Salt water	101
Sugar water	100

- (c) The graph shows the boiling point of water as a function of the amount of salt added. Suggest why the boiling point of water does not increase when sugar is added.

7 Complete the sentences and answer the question about thermal (heat) energy.

Choose from the following words.

conduction

conductor

convection

evaporation

insulation

insulator

radiation

(a) The main form of thermal (heat) energy transfer in liquids and gases is called

.....

[1]

(b) Thermal (heat) energy is transferred through a solid by .....

[1]

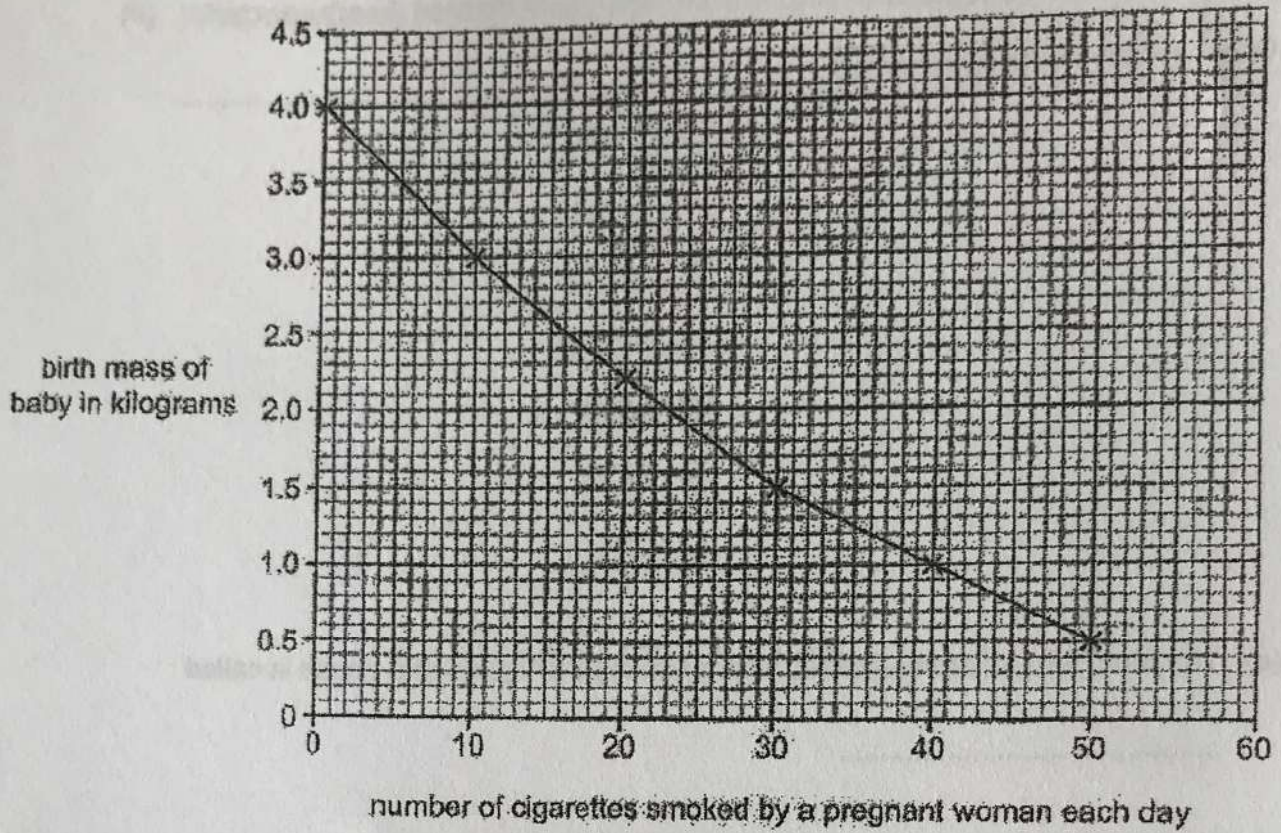
(c) Iron is a metal so it is a good .....

[1]

(d) What is the term for a poor conductor? .....

[1]

- 8 The graph shows how smoking during pregnancy affects the birth mass of babies.



- (a) Complete the sentence.

As the number of cigarettes smoked each day during pregnancy increases, the birth mass of a baby .....

[1]

- (b) What advice would you give to a pregnant woman who smokes?

[1]

9 Sodium is in Group 1 of the Periodic Table.

(a) Write down the chemical symbol for sodium.

..... [1]

(b) Sodium is a metal.

Tick (✓) the boxes next to the two correct properties of sodium.

Sodium conducts electricity.

Sodium does not conduct heat.

Sodium has a low boiling point.

Sodium is ductile.

Sodium is not malleable.

[2]

(c) Sodium reacts with water. A gas is formed.

(i) Name the gas that is formed.

..... [1]

(ii) Potassium is another element in Group 1.

Potassium is below sodium in the Periodic Table.

Complete the sentence.

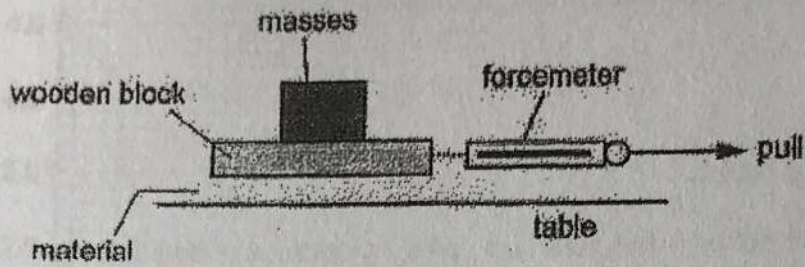
The rate of reaction of potassium with water is ..... than

the rate of reaction of sodium with water.

[1]

10 Safia and Priya investigate friction.

Here is the equipment they use.



They pull the wooden block with a forcemeter.

They repeat the investigation using different materials.

(a) What two measurements should they make?

.....  
 ..... [2]

(b) The materials they use have different surfaces.

Some of the materials are smoother.

Some of the materials are rougher.

(i) Predict what will happen when the smoother materials are used.

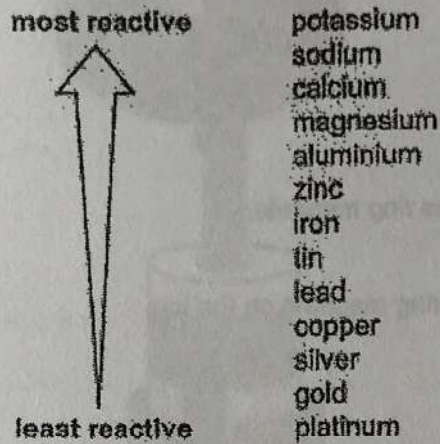
.....  
 ..... [1]

(ii) Explain your prediction.

.....  
 ..... [1]

11 Look at the diagram of the reactivity series.

It shows some metals in order of reactivity.



Use the diagram to answer these questions.

(a) (i) Which three metals react with cold water?

1 .....

2 .....

3 .....

[1]

(ii) Which gas is produced when metals react with acids?

.....

[1]

(b) It is possible to predict if a displacement reaction will happen using the reactivity series.

Tick (✓) two displacement reactions that will happen.

aluminium and silver nitrate

calcium and zinc sulfate

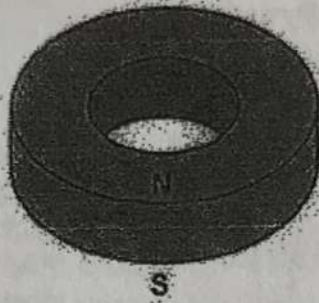
copper and sodium chloride

lead and iron nitrate

tin and magnesium chloride

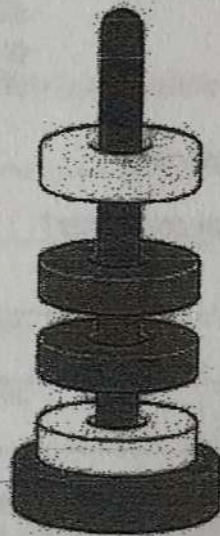
[2]

12: Ring magnets have a north pole (N) and a south pole (S).



Gabriella has a toy that uses ring magnets.

(a) She puts four of these ring magnets on the toy.



Explain why there are gaps between the magnets.

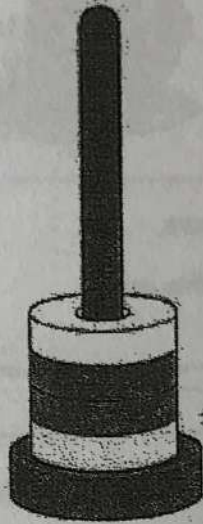
.....

.....

.....

[2]

(b) She puts the four ring magnets on the toy in a different way.



Explain why there are no gaps between the magnets.

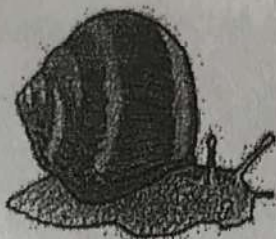
.....

.....

.....

[2]

## 13 Snails move slowly.



- (a) A snail moves 10 metres in 4 hours.

Calculate the average speed of this snail.

average speed ..... in metres per hour [2]

- (b) Another snail moves at a speed of 1.5 metres per hour.

Calculate the time it takes this snail to move 6 metres.

time ..... hours [1]