



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

**COMBINED SCIENCE**

**0653/01**

Paper 1 Multiple Choice

**May/June 2007**

**45 minutes**

Additional Materials: Multiple Choice Answer Sheet  
Soft clean eraser  
Soft pencil (type B or HB is recommended)

\* 8 0 4 1 9 9 5 9 3 3 \*

**READ THESE INSTRUCTIONS FIRST**

Write in soft pencil.

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

Write your name, Centre number and candidate number on the Answer Sheet in the spaces provided unless this has been done for you.

There are **forty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A, B, C** and **D**.

Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

**Read the instructions on the Answer Sheet very carefully.**

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.

Any rough working should be done in this booklet.

A copy of the Periodic Table is printed on page 20.

This document consists of **19** printed pages and **1** blank page.



2

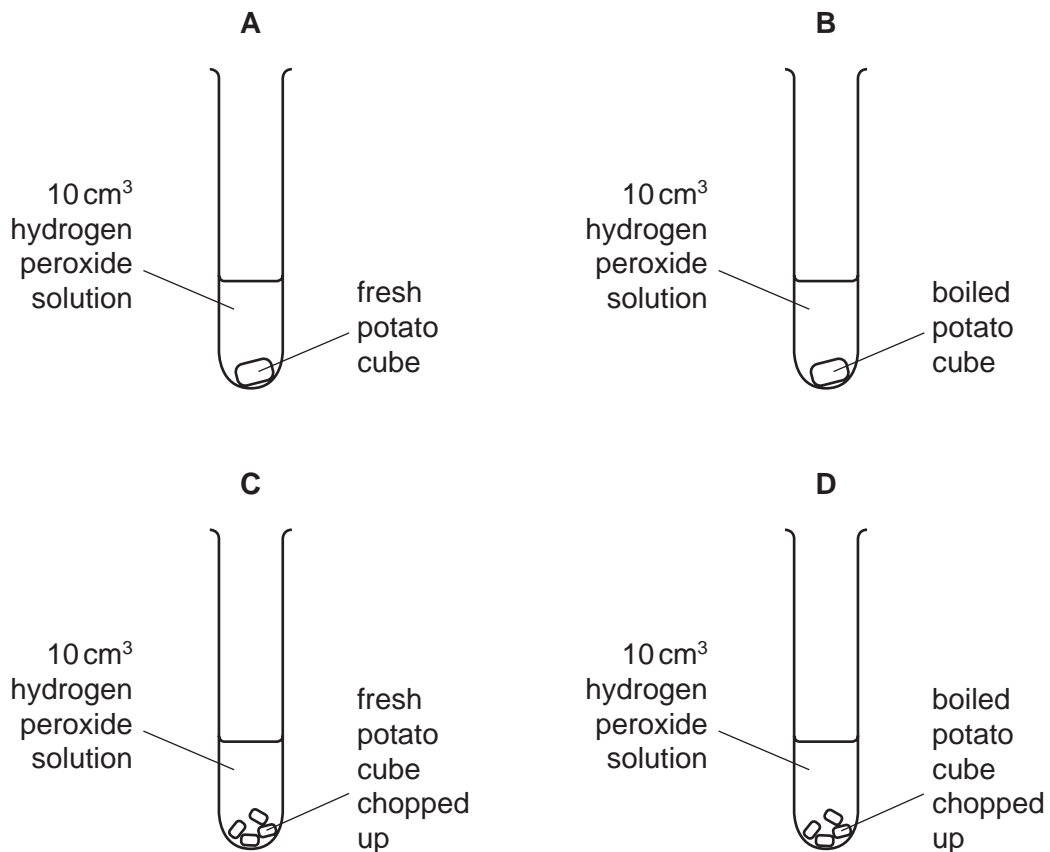
- 1 The table describes some parts of a plant cell.

Which part is the cellulose cell wall?

part	feature
<b>A</b>	allows free passage of water and dissolved substances
<b>B</b>	contains DNA
<b>C</b>	is partially permeable
<b>D</b>	synthesises glucose in sunlight

- 2 The diagrams show experiments to investigate the activity of the enzyme catalase which is found in potato.

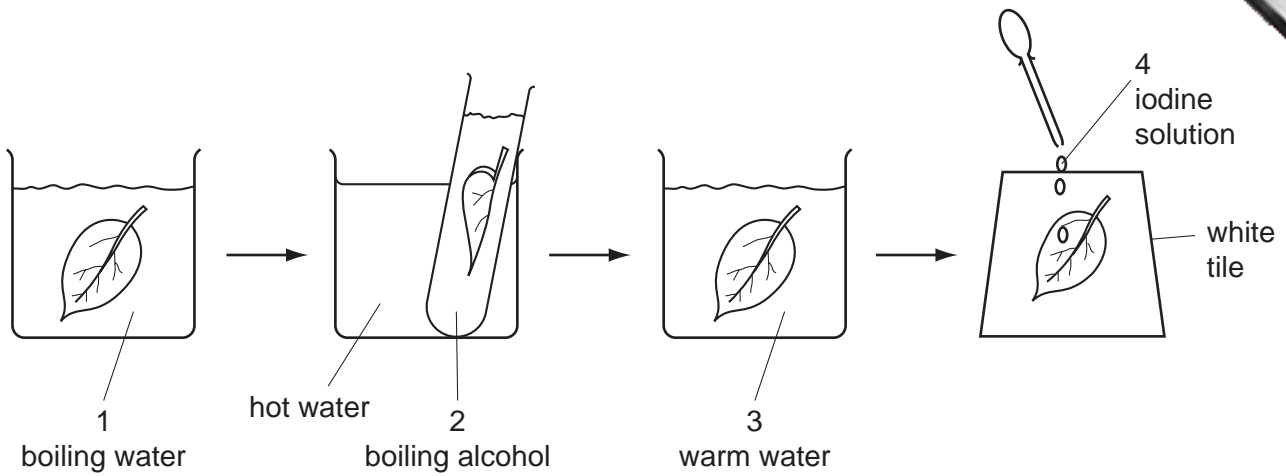
In which test-tube is oxygen produced fastest?



3

3 The flow diagram shows the stages in testing a green leaf for starch.

1, 2, 3 and 4 are all liquids.

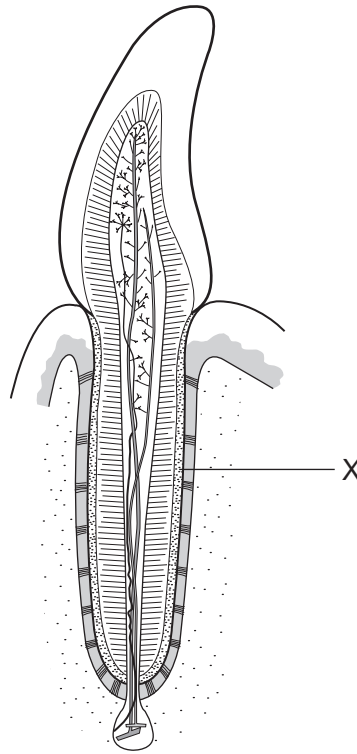


What are the colours of liquids 1, 2, 3 and 4 at the end of each stage for a leaf that contains starch?

	1	2	3	4
<b>A</b>	colourless	green	colourless	blue/black
<b>B</b>	colourless	colourless	green	brown
<b>C</b>	green	colourless	colourless	blue/black
<b>D</b>	green	green	colourless	brown

4

4 The diagram shows a vertical section through an incisor in the jaw.

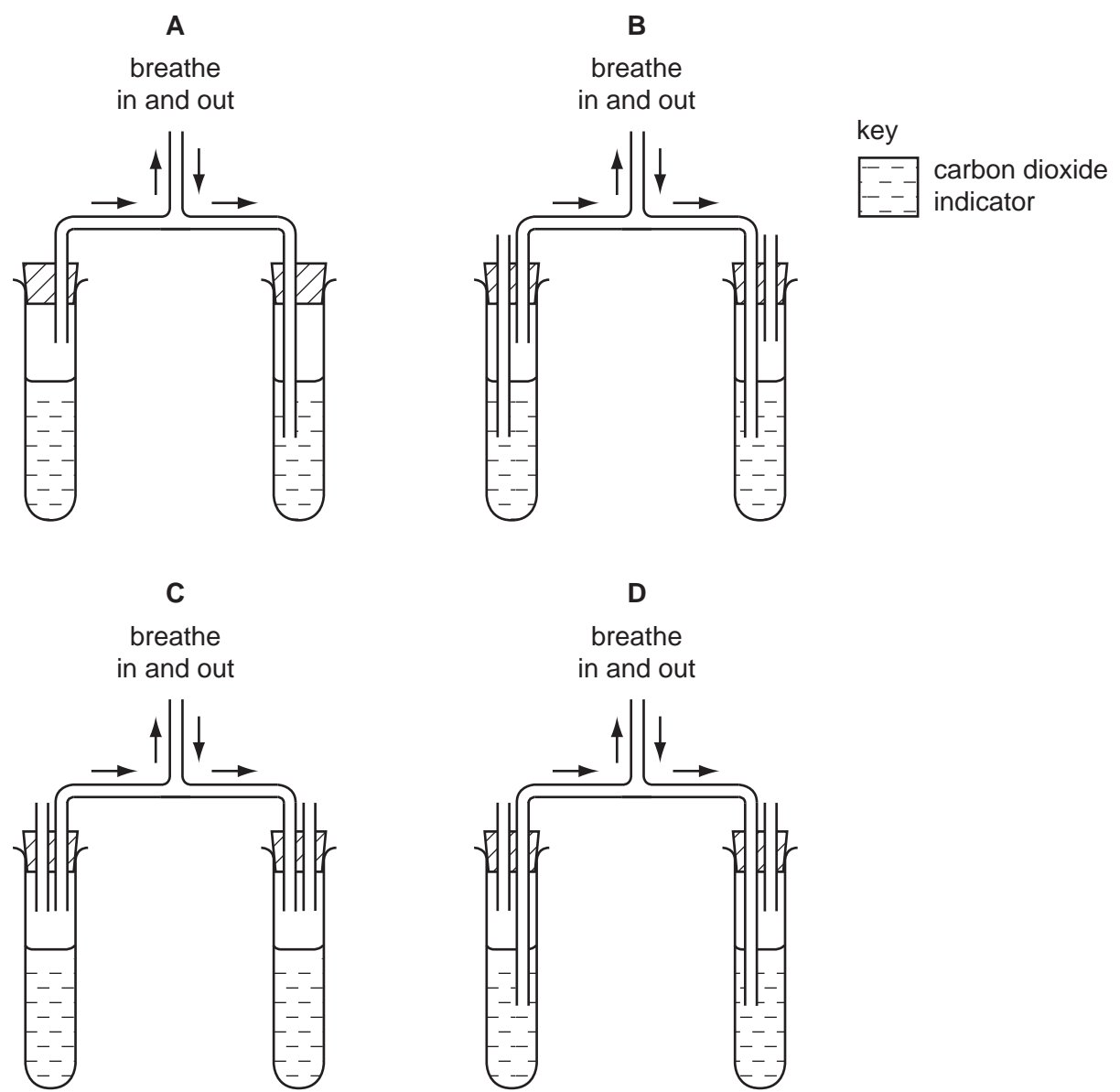


What is the name of the part labelled X?

- A cement
- B dentine
- C enamel
- D pulp

5 Four students assembled apparatus intended to show that air breathed out contains more carbon dioxide than air breathed in.

Which apparatus is assembled correctly?



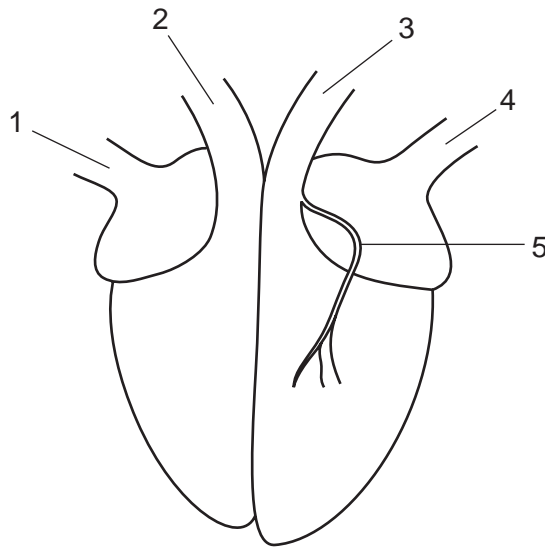
6 A person accidentally touches a very hot object with their hand.

What identifies the receptor, the speed of response and the type of response?

	receptor	speed of response	type of response
<b>A</b>	skin	rapid	nervous
<b>B</b>	muscle	slow	hormonal
<b>C</b>	eye	rapid	hormonal
<b>D</b>	brain	slow	nervous

6

7 The diagram shows an external view of the human heart.



Which vessels contain oxygenated blood?

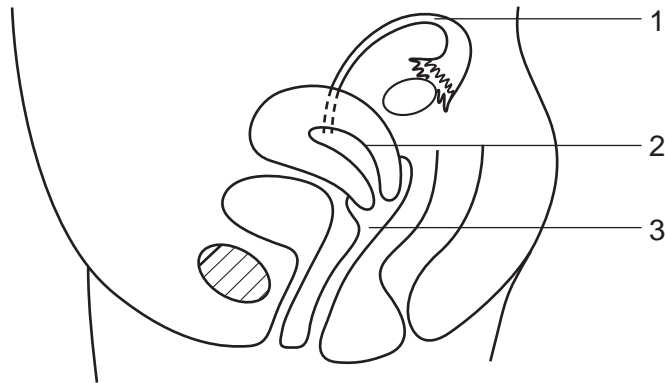
- A** 1, 2 and 4      **B** 1, 3 and 4      **C** 2, 3 and 5      **D** 3, 4 and 5

8 Water moves through the stomata of leaves during transpiration.

In which direction, and in which form, does it move?

	direction	form
<b>A</b>	into the leaf	liquid
<b>B</b>	into the leaf	vapour
<b>C</b>	out of the leaf	liquid
<b>D</b>	out of the leaf	vapour

- 9 The diagram shows a side view of the female reproductive system in a human.



Where do fertilisation and implantation occur?

	fertilisation	implantation
<b>A</b>	1	2
<b>B</b>	2	1
<b>C</b>	2	3
<b>D</b>	3	2

- 10 Which structure in a flower produces pollen?

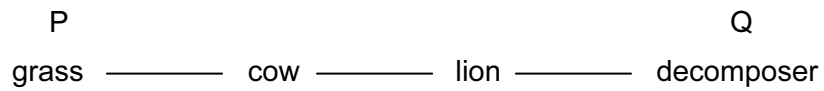
- A** sepal
- B** stamen
- C** stigma
- D** style

- 11 A gardener uses only asexual reproduction to produce clones of a flowering plant. The original plant had red flowers but some cloned plants had blue flowers.

What explains this change in flower colour?

- A** height of plant
- B** insect pollination
- C** variation caused by genes
- D** variation caused by the environment

12 The diagram represents a feeding relationship through which energy flows.



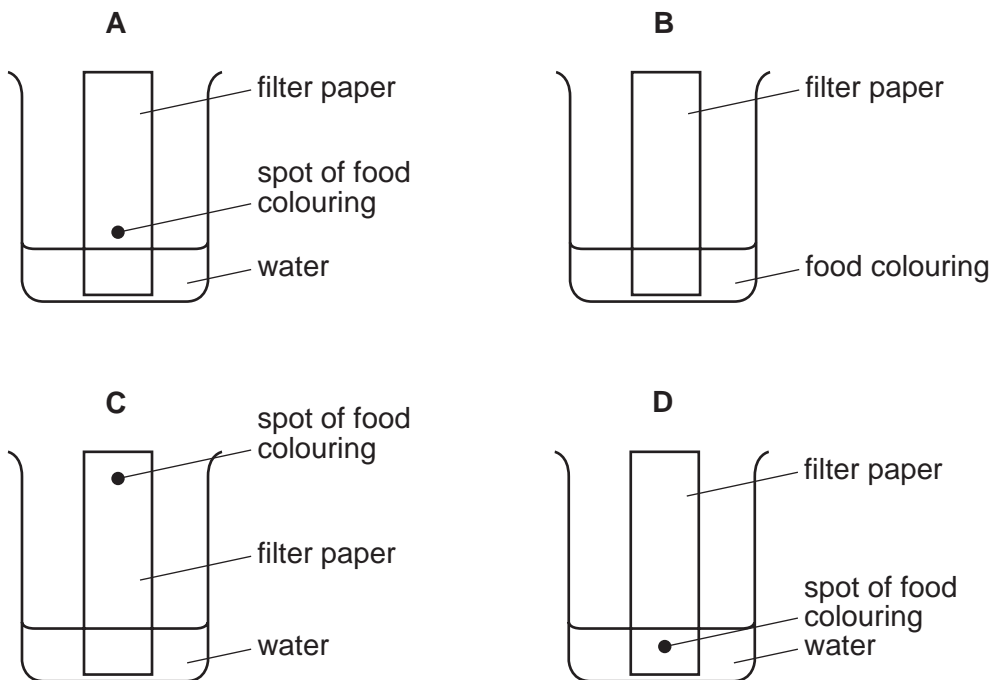
What is the type of the feeding relationship and the direction in which the energy flows?

	type of relationship	direction of energy flow
<b>A</b>	food chain	P to Q
<b>B</b>	food chain	Q to P
<b>C</b>	food web	P to Q
<b>D</b>	food web	Q to P

13 Which farming practice increases species diversity?

- A** cutting down trees
- B** grazing more cattle
- C** maintaining plant cover
- D** using tractors

14 Which diagram shows how a mixture of dyes in a food colouring can be separated?





15 Which two elements form covalent bonds when they combine with each other?

- A calcium and oxygen
- B hydrogen and oxygen
- C magnesium and chlorine
- D sodium and chlorine

16 The symbols, nucleon numbers and proton numbers of three elements are shown.



A student is asked to write the nucleon number and proton number of another element.

Using the Periodic Table, which two numbers are correct?

	nucleon number	proton number
<b>A</b>	18	11
<b>B</b>	18	12
<b>C</b>	23	11
<b>D</b>	47	23

17 Why are noble gases unreactive?

- A They have a complete outer shell of electrons.
- B They have an even number of electrons.
- C They have an even number of shells of electrons.
- D They have two electrons in the first shell.

18 Which elements exist as diatomic molecules?

	bromine	calcium	chlorine	magnesium
<b>A</b>	✓	x	x	✓
<b>B</b>	✓	x	✓	x
<b>C</b>	x	✓	✓	x
<b>D</b>	x	✓	x	✓

key

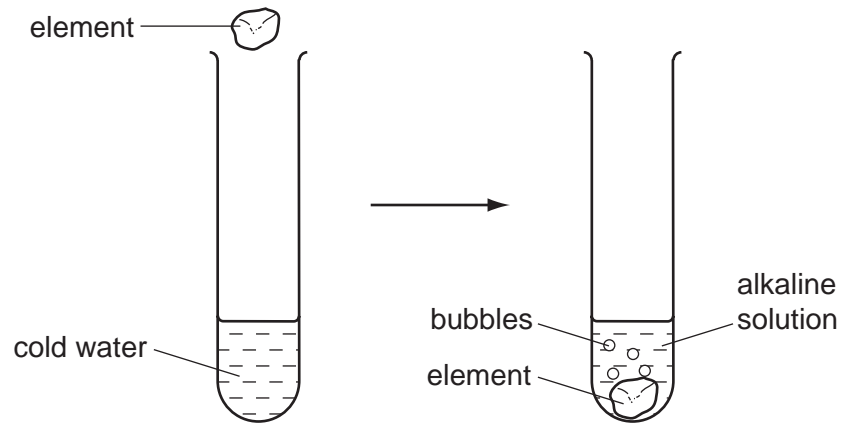
✓ correct

x not correct

19 Which method is used to obtain iron from iron(III) oxide?

- A combustion
- B electrolysis
- C reduction
- D thermal decomposition

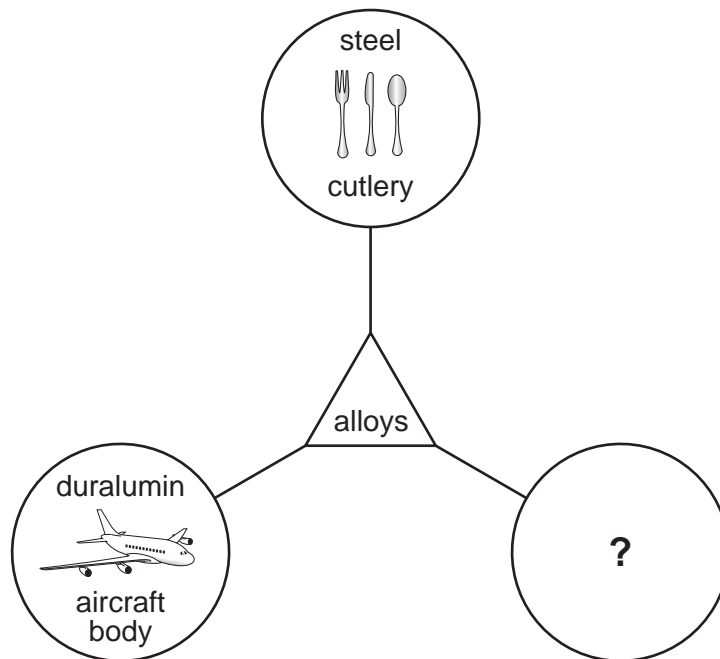
20 The diagrams show an experiment.



What could the element be?

- A calcium
- B carbon
- C copper
- D sulphur

21 The diagram shows uses of alloys.



Which picture could be used to complete the diagram?

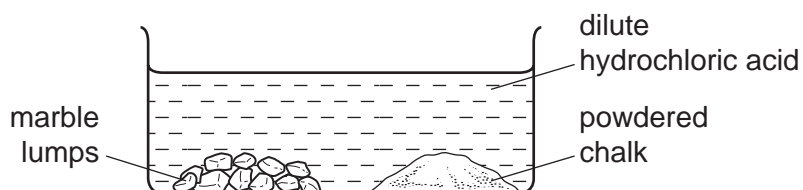
A	B	C	D
<p>argon light bulb</p>	<p>brass electric plug</p>	<p>silicon computer chips</p>	<p>zinc galvanised bucket</p>

22 Which equation shows the thermal decomposition of a compound?

- A  $\text{CaCO}_3 \rightarrow \text{CaO} + \text{CO}_2$
- B  $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$
- C  $\text{NaOH} + \text{HNO}_3 \rightarrow \text{NaNO}_3 + 2\text{H}_2\text{O}$
- D  $3\text{H}_2 + \text{N}_2 \rightarrow 2\text{NH}_3$

23 Marble and chalk are two forms of calcium carbonate.

The diagram shows equal masses of lumps of marble and powdered chalk placed in dilute hydrochloric acid.



The marble takes longer than the chalk to dissolve in the acid.

Why is this?

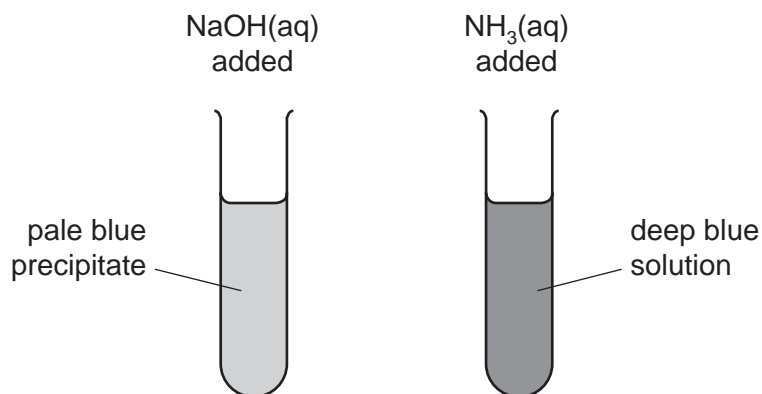
- A Marble is more reactive than chalk.
- B Marble is more soluble than chalk.
- C The marble has the smaller surface area.
- D The marble is more basic.

24 The diagrams show the results of adding an excess of

$\text{NaOH(aq)}$ ,

$\text{NH}_3(\text{aq})$ ,

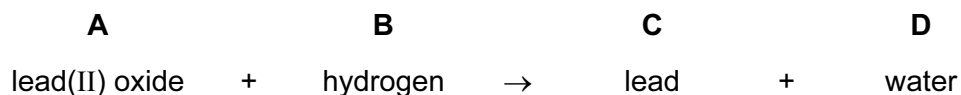
to a solution of salt S.



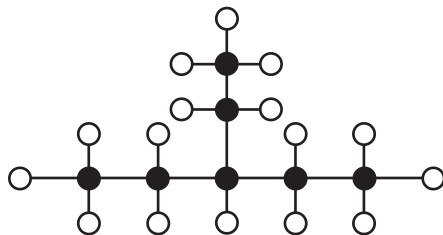
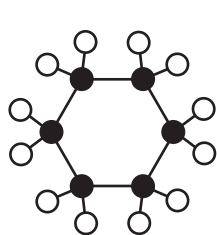
Which metal ion is present in salt S?

- A  $\text{Cu}^{2+}$
- B  $\text{Fe}^{2+}$
- C  $\text{Fe}^{3+}$
- D  $\text{Zn}^{2+}$

25 Which substance is reduced during the following reaction?



26 The diagrams show models of two molecules found in crude oil.



key

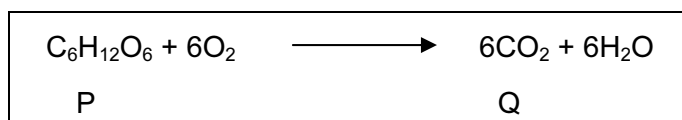
● = atom of X

○ = atom of Y

Which element could X be?

- A carbon
- B hydrogen
- C nitrogen
- D oxygen

27 The reaction shown occurs naturally.

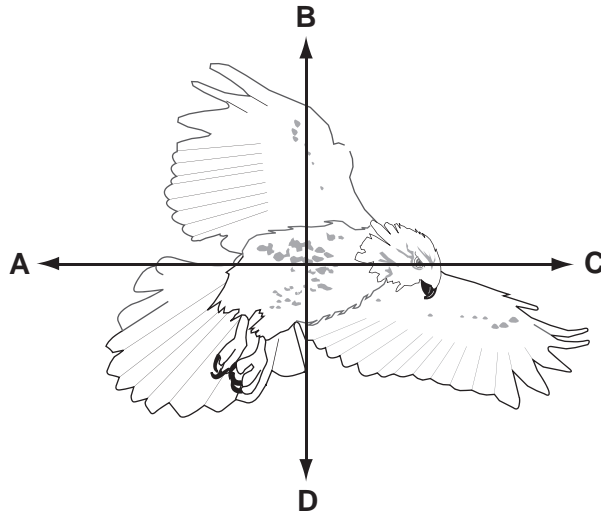


Which descriptions of P and Q are correct?

	P is a hydrocarbon	Q is an acidic oxide
<b>A</b>	yes	yes
<b>B</b>	yes	no
<b>C</b>	no	yes
<b>D</b>	no	no

28 The diagram shows a bird in flight.

In which direction does the weight of the bird act?

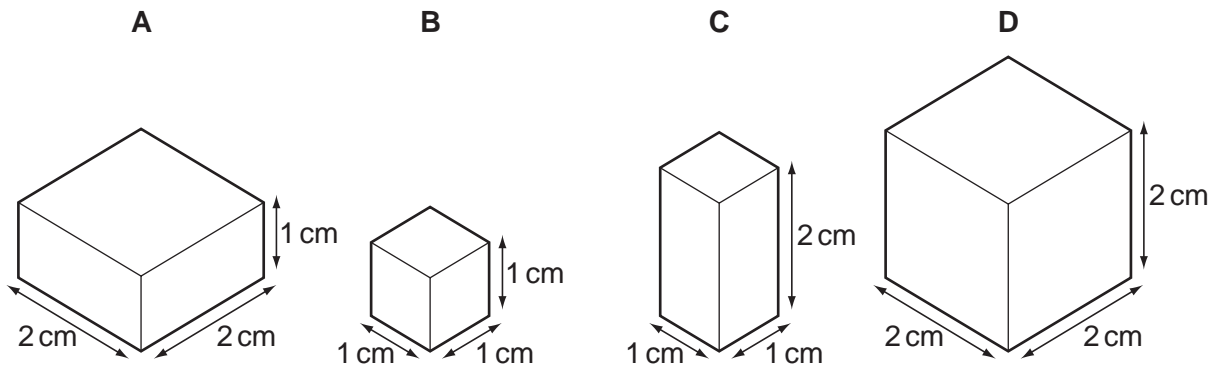


29 Which of the following is a unit of density?

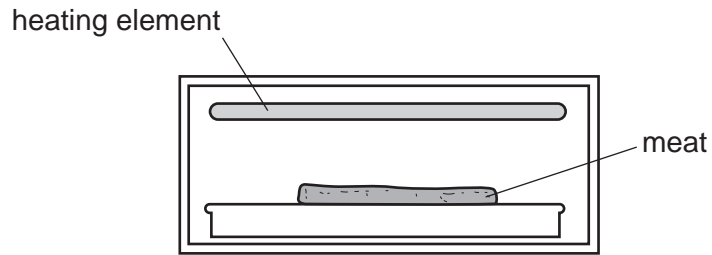
- A  $\text{cm}^3/\text{g}$       B  $\text{g}/\text{cm}^2$       C  $\text{g}/\text{cm}^3$       D  $\text{kg}/\text{m}^2$

30 Each of the solids shown in the diagram has the same mass.

Which solid has the greatest density?

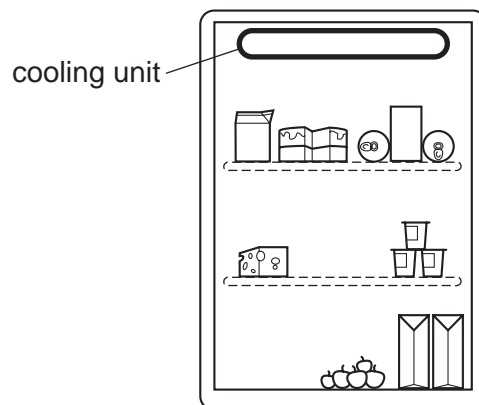


- 31 Meat can be cooked by placing it below, but not touching, a heating element.



Which process transfers thermal energy from the heating element to the meat?

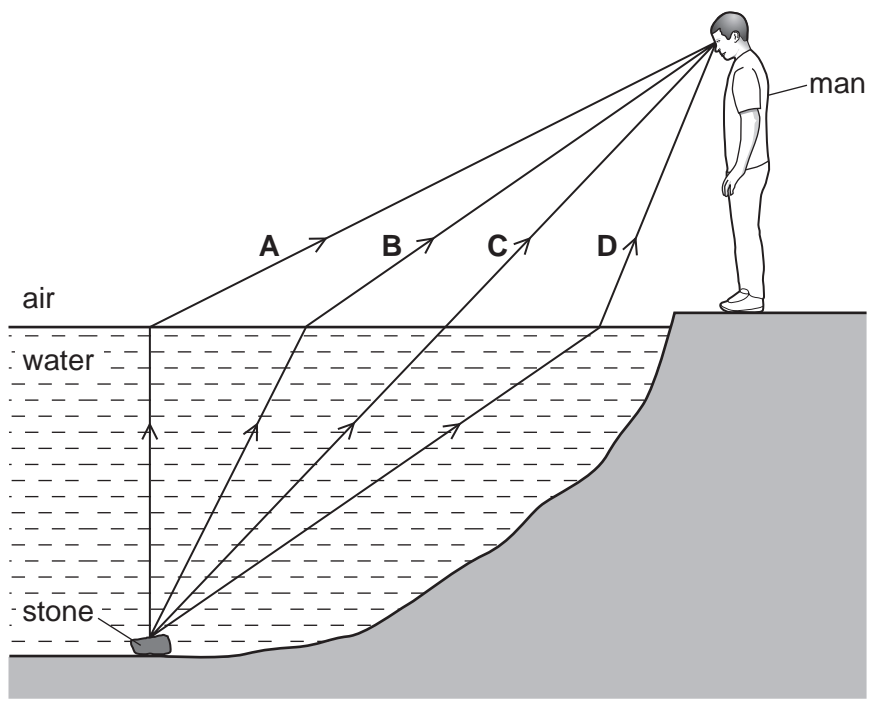
- A conduction
  - B convection
  - C insulation
  - D radiation
- 32 The diagram shows a refrigerator. The cooling unit is placed at the top. The cooling unit cools the air near it.



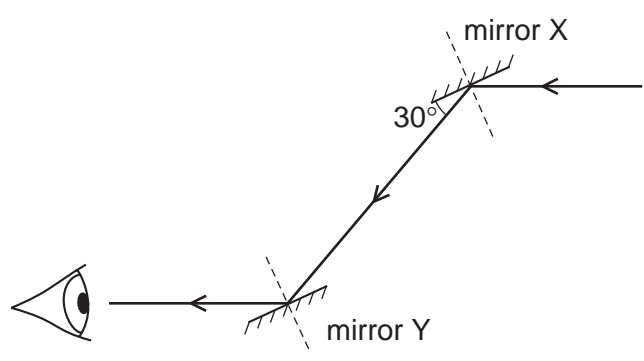
What happens to the density of this air as it cools and how does it move?

	density of the air	movement of the air
<b>A</b>	decreases	moves down
<b>B</b>	decreases	stays where it is
<b>C</b>	increases	moves down
<b>D</b>	increases	stays where it is

33 A man sees a stone at the bottom of a pool of water.  
Which path could be taken by light from the stone to the man?



34 A ray of light is reflected by two parallel plane mirrors X and Y.

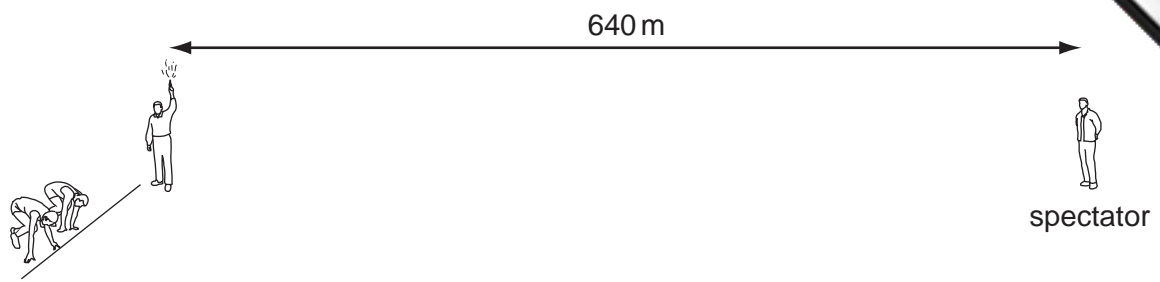


Which statement is correct?

- A The angle of incidence at mirror X is  $30^\circ$ .
- B The angle of incidence at mirror Y is  $60^\circ$ .
- C The angle of reflection at mirror X is  $120^\circ$ .
- D The angle of reflection at mirror Y is  $0^\circ$ .



35 A starting pistol is fired 640 m away from a spectator.

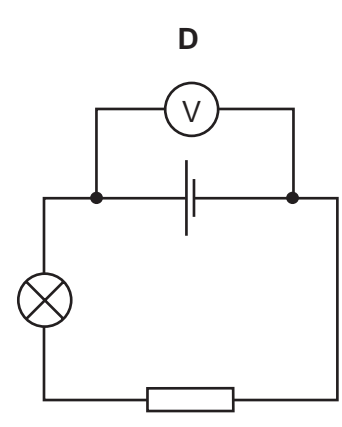
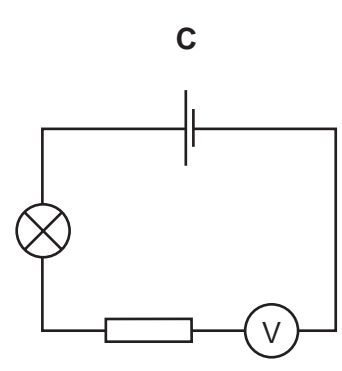
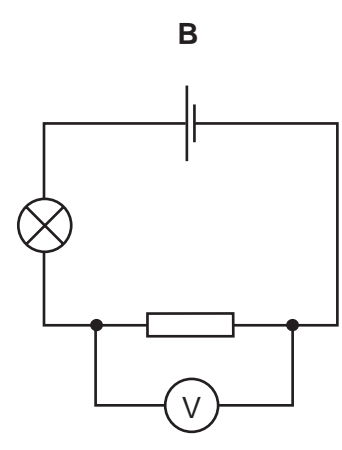
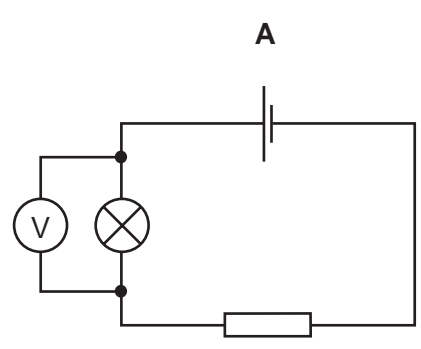


The spectator hears the sound of the starting pistol two seconds after seeing the flash.

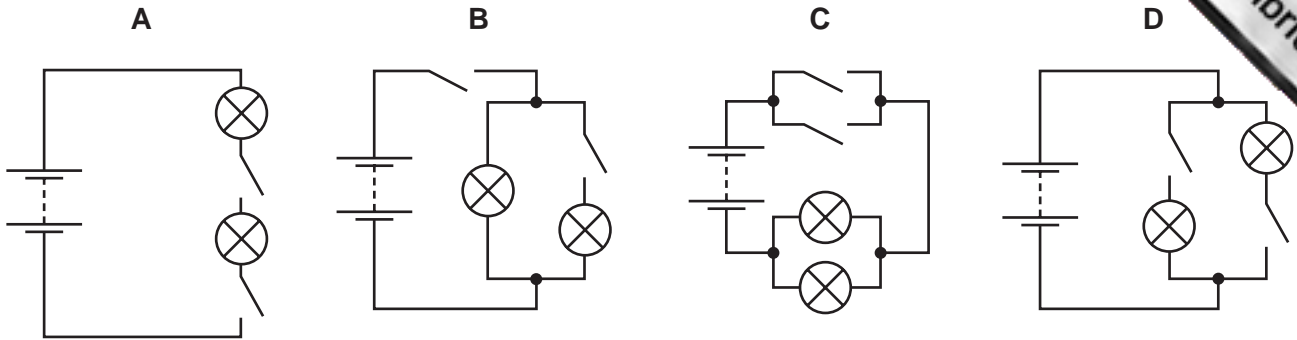
What is the speed of sound in air?

- A 160 m/s
- B 320 m/s
- C 640 m/s
- D 1280 m/s

36 Which circuit shows the correct use of a voltmeter in measuring the p.d. across the resistor?



37 Which diagram shows a circuit that will allow the lamps to be switched on and off independently?

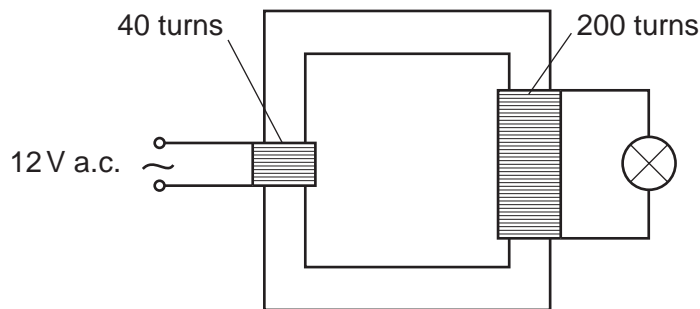


38 A cable in a house is carrying too much current.

What is the greatest danger?

- A appliances not working
- B electric shock
- C fire
- D low power

39 The diagram shows a lamp connected to a transformer.



What is the potential difference across the lamp?

- A 2.4V
- B 12V
- C 60V
- D 240V

40 What are the most penetrating and the least penetrating types of radiation?

	most penetrating	least penetrating
A	alpha-particles	beta-particles
B	beta-particles	alpha-particles
C	gamma-rays	alpha-particles
D	gamma-rays	beta-particles



