



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
General Certificate of Education Ordinary Level

**SCIENCE (CHEMISTRY, BIOLOGY)**

**5126/01**

Paper 1 Multiple Choice

**October/November 2007**

**1 hour**

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



**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.

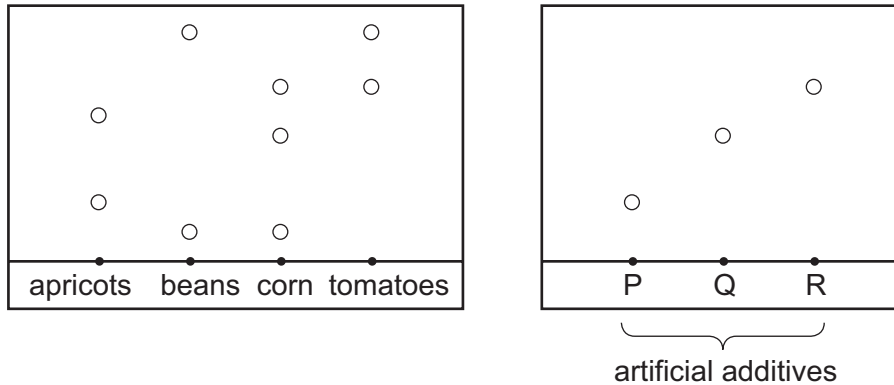
This document consists of **17** printed pages and **3** blank pages.



- 1 Samples of tinned apricots, beans, corn and tomatoes are tested for additives by using chromatography.

The chromatograms are compared with those of three artificial additives, P, Q and R.

The results are as follows.



Which tinned food does **not** contain any artificial additives?

- A apricots
  - B beans
  - C corn
  - D tomatoes
- 2 A substance is in a state in which its particles are widely spaced and able to move freely.

It changes to a state in which its particles are in contact but still able to move freely.

What is this change called?

- A condensation
  - B diffusion
  - C evaporation
  - D freezing
- 3 Element X has proton number 8 and nucleon number 18.

Which particles are present in the  $X^{2-}$  ion?

- A 10 electrons, 8 protons, 8 neutrons
- B 10 electrons, 8 protons, 10 neutrons
- C 10 electrons, 9 protons, 9 neutrons
- D 8 electrons, 8 protons, 18 neutrons

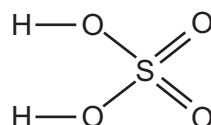
4 The table gives the electronic structure of four elements.

element	electronic structure
W	2.7
X	2.8.5
Y	2.8.6
Z	2.8.8.2

Which two elements form an ionic compound?

- A** W and X      **B** W and Y      **C** W and Z      **D** X and Y

5 A molecule of sulphuric acid has the structural formula shown.



How many electrons are involved in forming all the covalent bonds in one molecule?

- A** 6      **B** 8      **C** 12      **D** 16

6 The formula of copper(I) oxide is  $\text{Cu}_2\text{O}$ .

How many grams of oxygen are combined with 64 g of copper in this compound?

- A** 8      **B** 16      **C** 32      **D** 64

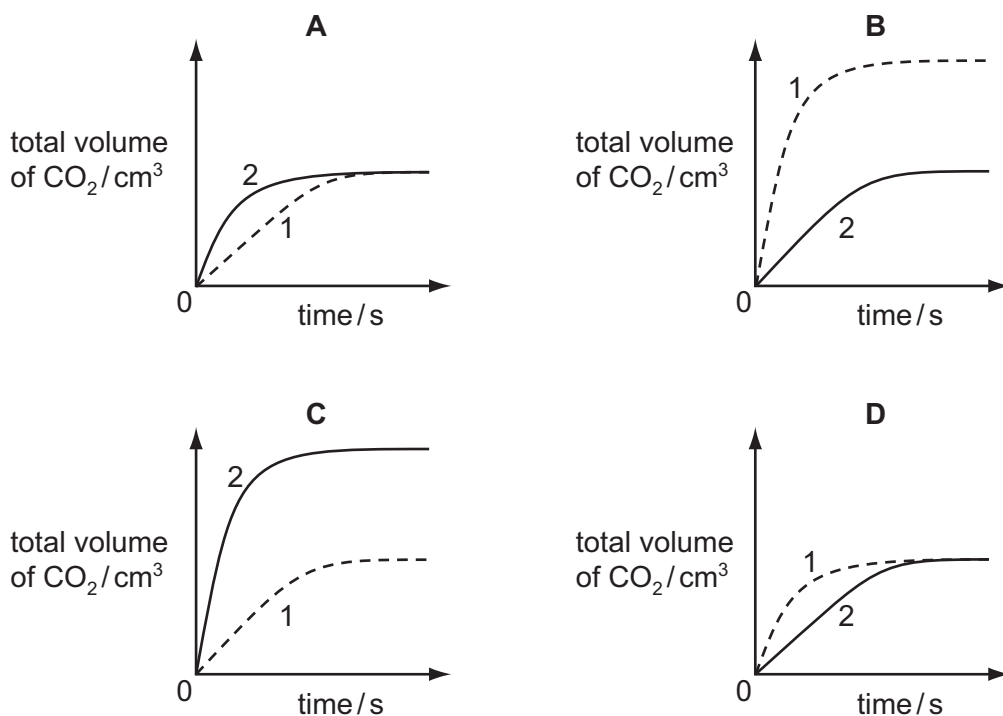
7 Which gas is always produced during photosynthesis?

- A** carbon dioxide  
**B** methane  
**C** oxygen  
**D** water vapour

- 8 In two separate experiments, the reaction of powdered calcium carbonate with an excess of dilute hydrochloric acid is investigated.

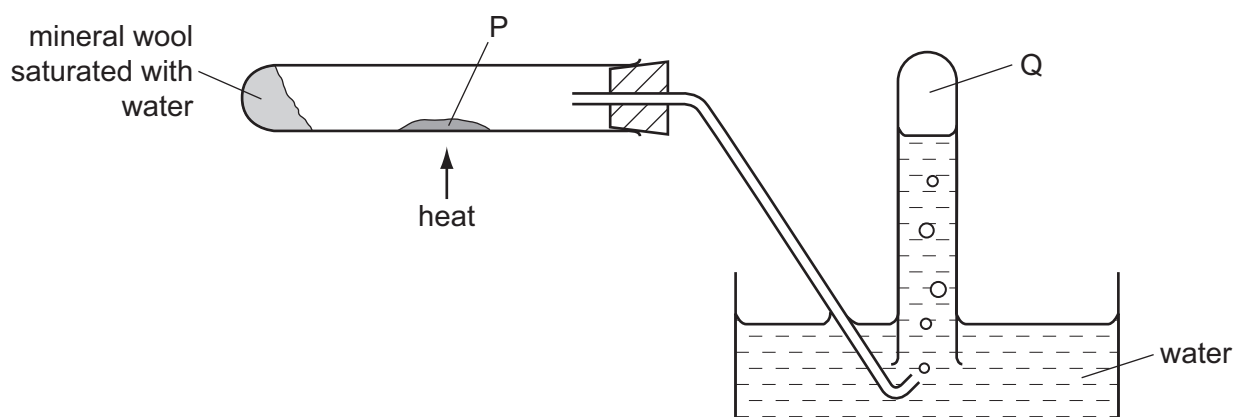
The powder used in experiment 1 is finer than that used in experiment 2. All other conditions are identical in both experiments.

Which graph shows the results?



- 9 Which type of reaction takes place when H<sup>+</sup> ions and OH<sup>-</sup> ions react to form water?
- A condensation
  - B ionisation
  - C neutralisation
  - D precipitation
- 10 Which statement about the alkali metals is correct?
- A Their melting points decrease on descending the group.
  - B Their reactivities decrease on descending the group.
  - C They form covalent bonds with the halogens.
  - D They form oxides on reacting with water.

- 11 In the experiment shown in the diagram, steam is passed over a heated solid P. Gas Q is collected.



What are substances P and Q?

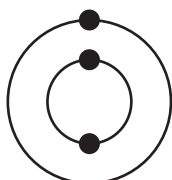
	P	Q
<b>A</b>	copper	hydrogen
<b>B</b>	lead	oxygen
<b>C</b>	silver	oxygen
<b>D</b>	zinc	hydrogen

- 12 The diagrams show the electronic structures of four elements.

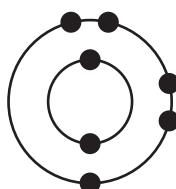
element 1



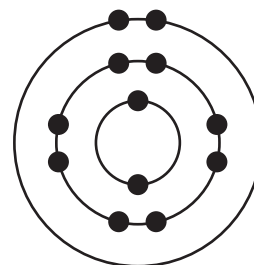
element 2



element 3



element 4



Which two elements are metals?

- A** 1 and 2      **B** 1 and 3      **C** 2 and 4      **D** 3 and 4
- 13 Which substance is added to a blast furnace to remove impurities from iron ore?

- A** carbon  
**B** limestone  
**C** sand  
**D** slag

14 Which pollutant is correctly linked to its source?

	pollutant	source
<b>A</b>	carbon monoxide	internal combustion engine
<b>B</b>	methane	volcanoes
<b>C</b>	nitrogen oxide	bacterial decay
<b>D</b>	sulphur dioxide	lightning activity

15 Which gas is used to convert vegetable oils into margarine?

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

16 Which statement about the manufacture of ammonia by the Haber Process is correct?

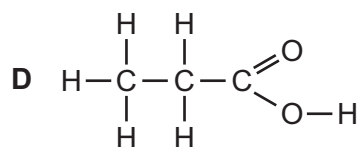
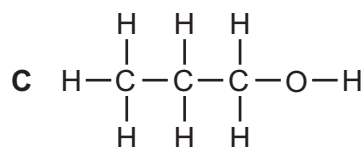
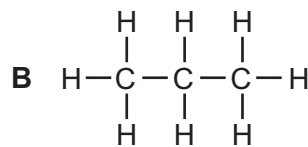
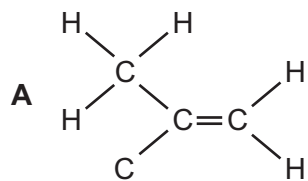
- A** The reactants and product are compounds.
- B** The reactants and product are elements.
- C** The reactants and product are gases.
- D** The reactants are both obtained from the air.

17 Bitumen is obtained from crude oil.

What is it used for?

- A** as fuel for aircraft
- B** as fuel for oil stoves
- C** for making polishes
- D** for making roads

18 Which compound decolourises aqueous bromine?



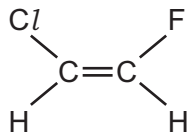
19 Compound X has the molecular formula  $C_2H_6O$ .

- X can be made by a fermentation process.
- X can be oxidised to Y.
- X can react with Y to form Z and water.

To which homologous series do X, Y and Z belong?

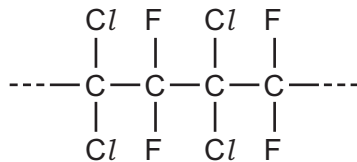
	X	Y	Z
<b>A</b>	alcohols	carboxylic acids	esters
<b>B</b>	alcohols	esters	carboxylic acids
<b>C</b>	carboxylic acids	alcohols	esters
<b>D</b>	carboxylic acids	esters	alcohols

20 The diagram shows the structure of a monomer.

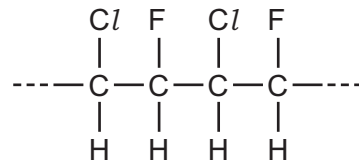


Which polymer is made from this monomer?

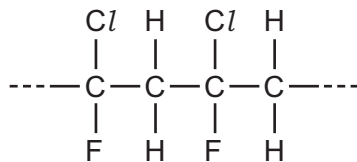
**A**



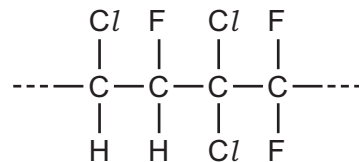
**B**



**C**



**D**



21 Which cell structure contains the light-absorbing pigments in plants?

- A** chloroplast
- B** cytoplasm
- C** nucleus
- D** vacuole

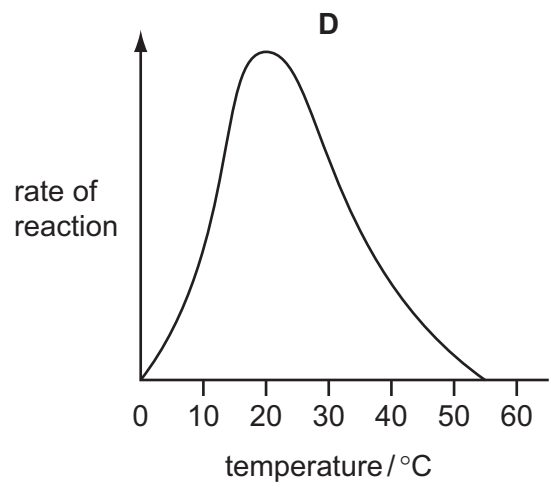
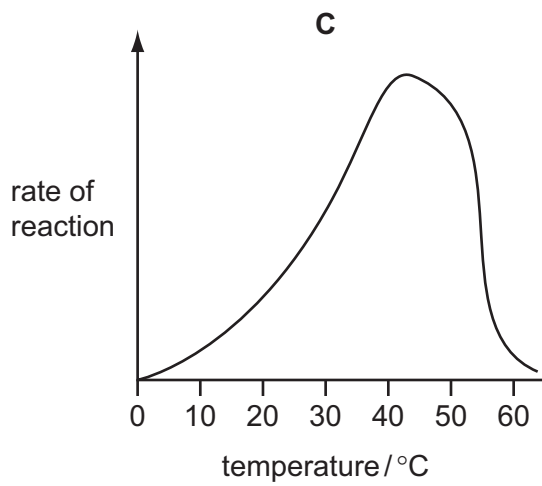
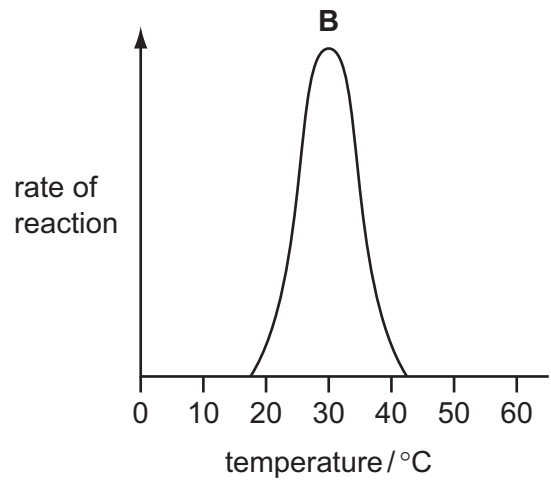
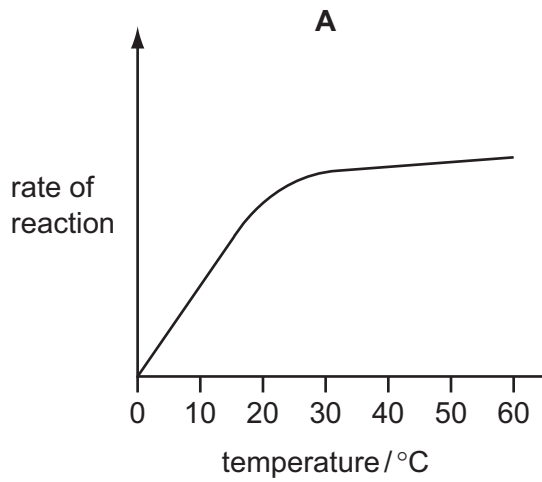
22 A human red blood cell is placed in a strong salt solution.

In which direction does water move and what is the effect on the cell?

	movement of water	effect on cell
<b>A</b>	into the cell	slight increase in size
<b>B</b>	into the cell	cell bursts
<b>C</b>	out of the cell	slight decrease in size
<b>D</b>	out of the cell	no change in cell volume



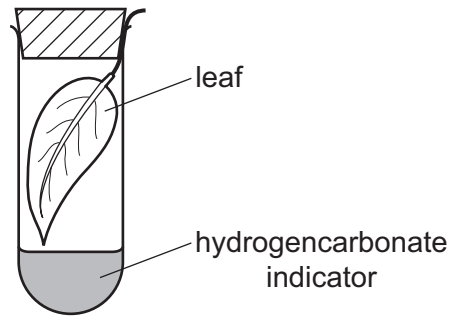
23 Which graph shows the effect of temperature on enzyme-controlled reactions?



24 How does most carbon dioxide reach the photosynthesising cells of a leaf?

- A** through the cuticle
- B** through the epidermis
- C** through the stomata
- D** through the xylem

- 25 A freshly picked leaf is placed in a sealed test-tube with some hydrogencarbonate indicator solution. The indicator changes colour as shown.



colour	amount of carbon dioxide
purple	less than normal
red	normal
yellow	more than normal

Which colour will the hydrogencarbonate indicator be at midday and at midnight?

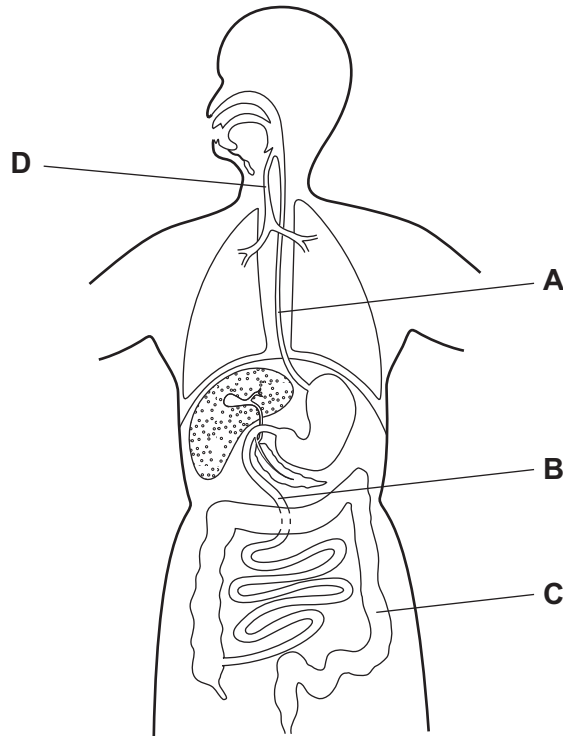
	at midday	at midnight
<b>A</b>	purple	yellow
<b>B</b>	red	purple
<b>C</b>	yellow	purple
<b>D</b>	yellow	red

- 26 Which part of the alimentary canal is most acidic?

- A** colon
- B** ileum
- C** mouth
- D** stomach

27 The diagram shows some organs of the human body.

Which structure does **not** move its contents by peristalsis?



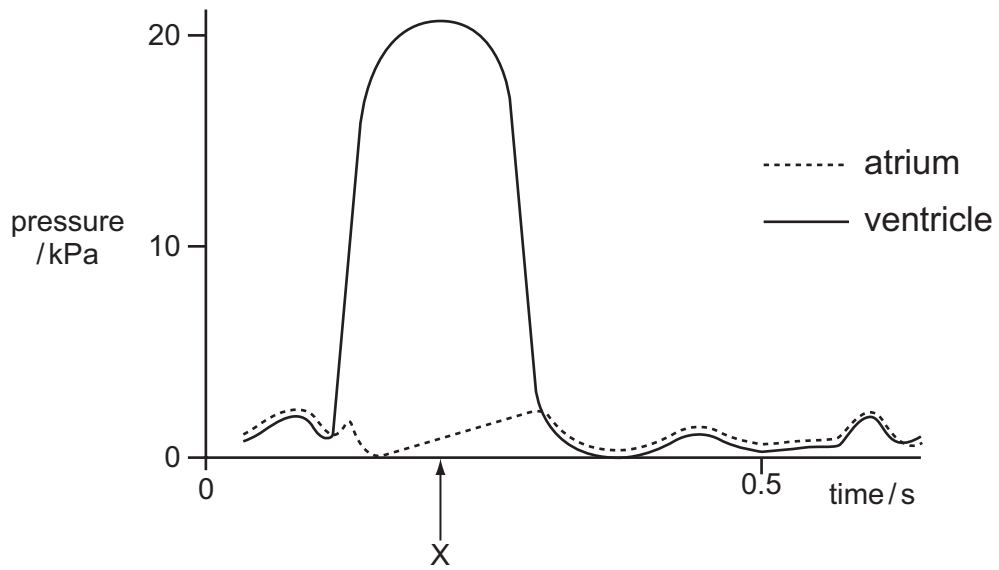
28 Four similar leafy shoots are exposed to different conditions. The rates of water uptake and the rates of water loss are measured.

The results are shown in the table.

Which shoot is most likely to wilt?

	water uptake /mm <sup>3</sup> per min	water loss /mm <sup>3</sup> per min
<b>A</b>	10	12
<b>B</b>	10	8
<b>C</b>	5	5
<b>D</b>	5	2

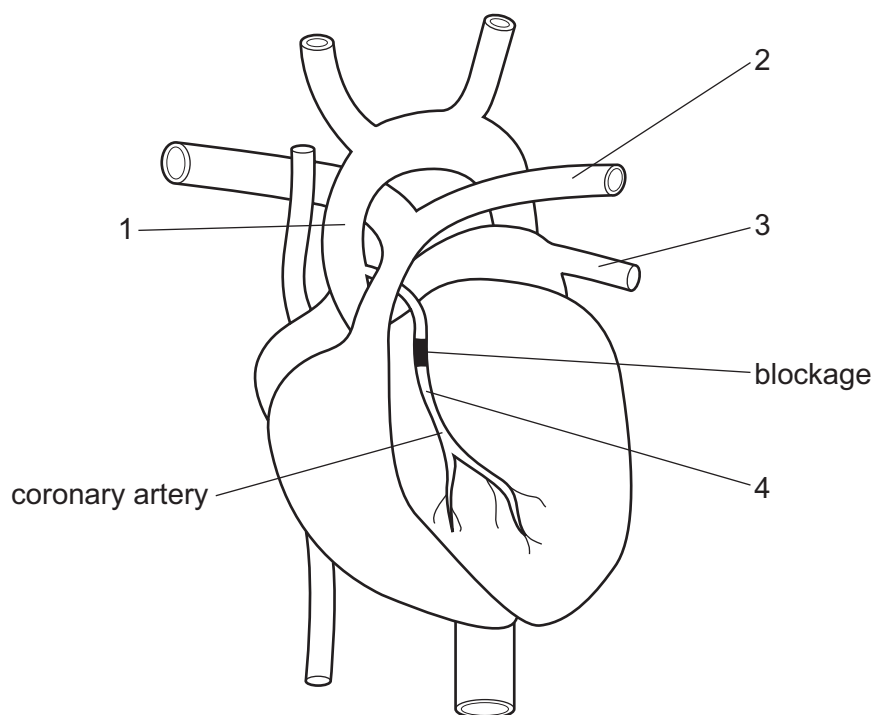
- 29 The graph shows pressure changes in the left atrium and in the left ventricle during one heartbeat.



What is the state of the valves at time X?

	bicuspid valve	semi-lunar valve (in aorta)
<b>A</b>	closed	closed
<b>B</b>	closed	open
<b>C</b>	open	closed
<b>D</b>	open	open

- 30 The diagram shows an external view of the heart of a patient with a blockage of the coronary artery. This could be treated by inserting a tube to by-pass the blockage.



Which two vessels would be joined by this tube?

- A** 1 and 2      **B** 1 and 4      **C** 2 and 4      **D** 3 and 4
- 31 The table shows the percentage composition of four samples of air.

Which sample could have been breathed out by a person after vigorous exercise?

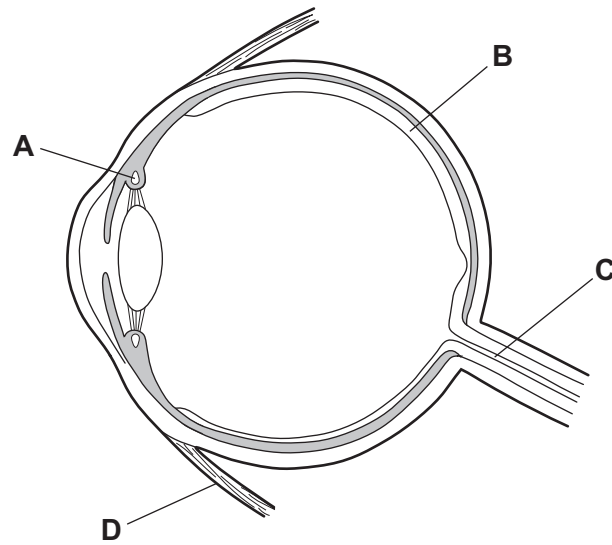
	oxygen	carbon dioxide	water vapour
<b>A</b>	16	0.3	saturated
<b>B</b>	16	4	saturated
<b>C</b>	21	0.03	trace
<b>D</b>	21	3	trace

- 32 What is **not** an excretory product of mammals?

- A** carbon dioxide in expired air  
**B** undigested food in faeces  
**C** urea in sweat  
**D** urea in urine

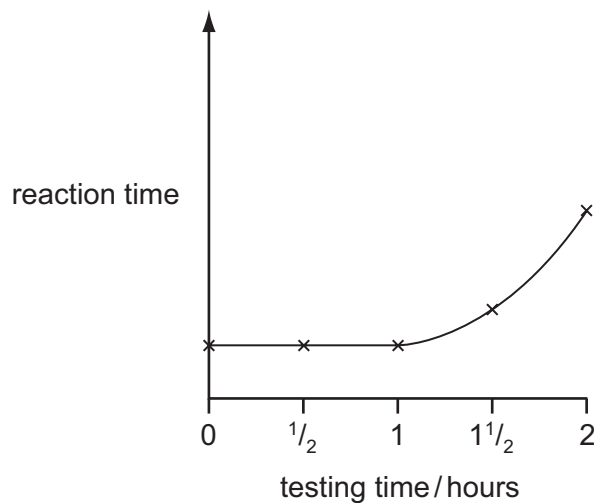
33 The diagram shows a section through an eye.

Which part helps to focus an image on the retina?



34 An experiment was carried out in which the reaction time for a person to respond to seeing a light was measured. Every half hour the person was given an alcoholic drink and the test was repeated.

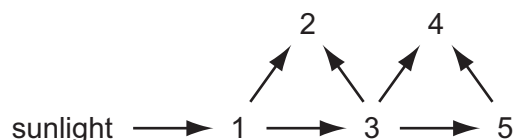
The results over two hours are shown in the diagram below.



Which deduction can be made from the experiment?

- A Alcoholic drinks make the person react more slowly.
- B Mental activities are stimulated by small quantities of alcohol.
- C The alcohol content of the blood rises rapidly after 1 hour.
- D The person reacts more quickly as a result of practice.

35 The diagram shows energy flow in a food web.

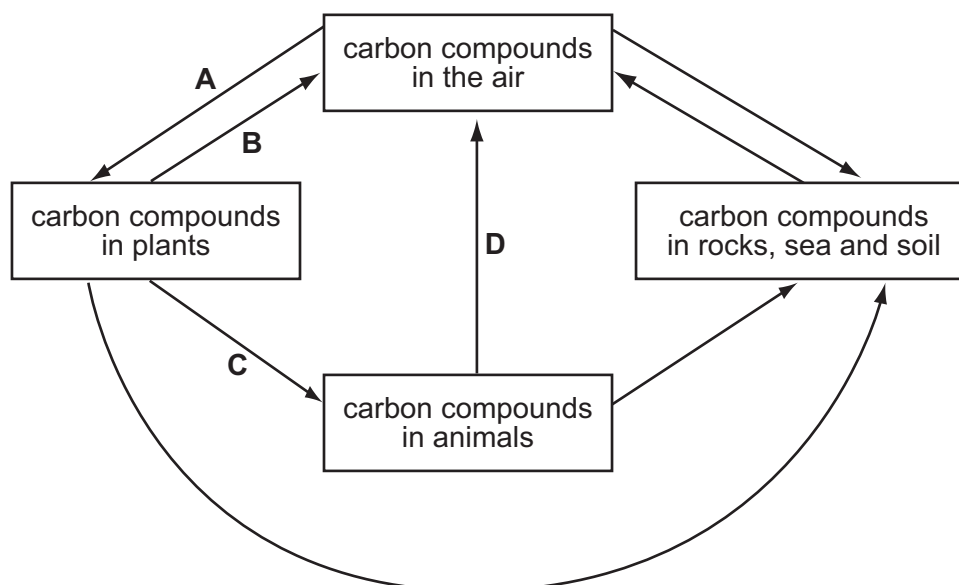


Which number represents an organism that eats both plants and animals?

- A 2                      B 3                      C 4                      D 5

36 The diagram shows part of the carbon cycle.

Which arrow represents photosynthesis?



37 What increases the risk of famine?

- A decreased air pollution  
 B decreased population size  
 C increased carbon dioxide concentration in the air  
 D increased soil erosion

38 Which statement is true of asexual reproduction in plants?

- A Insects are needed to transfer pollen.  
 B New plants grow from seeds.  
 C Offspring are genetically identical to their parents.  
 D Two types of gametes are involved.

39 What is the path taken by sperm cells during ejaculation from the male reproductive system?

- A sperm duct → testis → urethra
- B sperm duct → urethra → testis
- C testis → sperm duct → urethra
- D testis → urethra → sperm duct

40 The genotype for the height of an organism is written as Tt.

Which conclusion may be drawn?

- A The allele for height has at least two different genes.
- B The gene for height has at least two different alleles.
- C There are two different genes for height, each having a single allele.
- D There are two different alleles for height, each having a single gene.







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**DATA SHEET**  
**The Periodic Table of the Elements**

		Group										
I	II	III	IV	V	VI	VII	0					
		1 <b>H</b> Hydrogen 1										4 <b>He</b> Helium 2
7 <b>Li</b> Lithium 3	9 <b>Be</b> Beryllium 4										20 <b>Ne</b> Neon 10	
23 <b>Na</b> Sodium 11	24 <b>Mg</b> Magnesium 12										35.5 <b>Cl</b> Chlorine 17	
39 <b>K</b> Potassium 19	40 <b>Ca</b> Calcium 20	11 <b>B</b> Boron 5	12 <b>C</b> Carbon 6	14 <b>N</b> Nitrogen 7	16 <b>O</b> Oxygen 8	19 <b>F</b> Fluorine 9	84 <b>Kr</b> Krypton 36	70 <b>Ga</b> Gallium 31	73 <b>Ge</b> Germanium 32	75 <b>As</b> Arsenic 33	79 <b>Se</b> Selenium 34	127 <b>I</b> Iodine 53
85 <b>Rb</b> Rubidium 37	88 <b>Sr</b> Strontium 38	27 <b>Al</b> Aluminium 13	28 <b>Si</b> Silicon 14	31 <b>P</b> Phosphorus 15	32 <b>S</b> Sulphur 16	35.5 <b>Cl</b> Chlorine 17	131 <b>Xe</b> Xenon 54	65 <b>Zn</b> Zinc 30	64 <b>Cu</b> Copper 29	59 <b>Ni</b> Nickel 28	59 <b>Co</b> Cobalt 27	115 <b>In</b> Indium 49
133 <b>Cs</b> Caesium 55	137 <b>Ba</b> Barium 56	45 <b>Sc</b> Scandium 21	48 <b>Ti</b> Titanium 22	51 <b>V</b> Vanadium 23	52 <b>Cr</b> Chromium 24	56 <b>Fe</b> Iron 26	204 <b>Pb</b> Lead 82	64 <b>Cu</b> Copper 29	59 <b>Ni</b> Nickel 28	59 <b>Co</b> Cobalt 27	56 <b>Fe</b> Iron 26	204 <b>Pb</b> Lead 82
226 <b>Ra</b> Radium 88	227 <b>Ac</b> Actinium 89	91 <b>Zr</b> Zirconium 40	91 <b>Zr</b> Zirconium 40	93 <b>Nb</b> Niobium 41	96 <b>Mo</b> Molybdenum 42	101 <b>Ru</b> Ruthenium 44	207 <b>Pb</b> Lead 82	106 <b>Pd</b> Palladium 46	106 <b>Pd</b> Palladium 46	103 <b>Rh</b> Rhodium 45	101 <b>Ru</b> Ruthenium 44	207 <b>Pb</b> Lead 82
		140 <b>Ce</b> Cerium 58	141 <b>Pr</b> Praseodymium 59	144 <b>Nd</b> Neodymium 60	146 <b>Pm</b> Promethium 61	150 <b>Sm</b> Samarium 62	209 <b>Bi</b> Bismuth 83	152 <b>Eu</b> Europium 63	152 <b>Eu</b> Europium 63	150 <b>Sm</b> Samarium 62	146 <b>Pm</b> Promethium 61	209 <b>Bi</b> Bismuth 83
		232 <b>Th</b> Thorium 90	232 <b>Pa</b> Protactinium 91	238 <b>U</b> Uranium 92	238 <b>U</b> Uranium 92	238 <b>U</b> Uranium 92	227 <b>Ac</b> Actinium 89	238 <b>U</b> Uranium 92	238 <b>U</b> Uranium 92	238 <b>U</b> Uranium 92	238 <b>U</b> Uranium 92	227 <b>Ac</b> Actinium 89
		162 <b>Dy</b> Dysprosium 66	163 <b>Ho</b> Holmium 67	164 <b>Er</b> Erbium 68	165 <b>Tm</b> Thulium 69	167 <b>Yb</b> Ytterbium 70	169 <b>Lu</b> Lutetium 71	169 <b>Tm</b> Thulium 69	167 <b>Yb</b> Ytterbium 70	165 <b>Ho</b> Holmium 67	163 <b>Er</b> Erbium 68	162 <b>Dy</b> Dysprosium 66
		100 <b>Fm</b> Fermium 100	101 <b>Md</b> Mendelevium 101	102 <b>No</b> Nobelium 102	103 <b>Lr</b> Lawrencium 103	103 <b>Lr</b> Lawrencium 103	103 <b>Lr</b> Lawrencium 103	100 <b>Fm</b> Fermium 100	101 <b>Md</b> Mendelevium 101	102 <b>No</b> Nobelium 102	103 <b>Lr</b> Lawrencium 103	103 <b>Lr</b> Lawrencium 103

\*58-71 Lanthanoid series  
†90-103 Actinoid series

a = relative atomic mass

X = atomic symbol

b = proton (atomic) number

Key

	<b>X</b>			
a		b		

The volume of one mole of any gas is 24 dm<sup>3</sup> at room temperature and pressure (r.t.p.).