CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

COMBINED SCIENCE **5129/01**

Paper 1 Multiple Choice

October/November 2003

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.

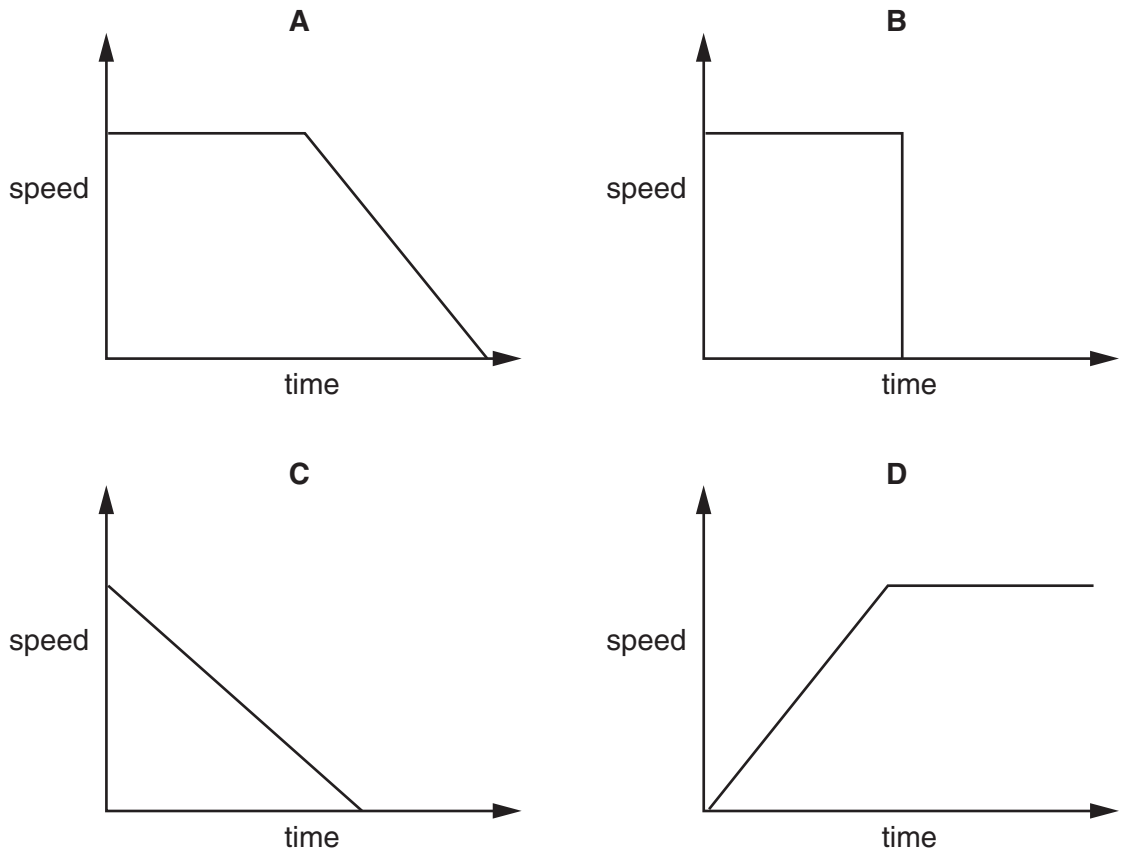
There are **forty** questions in this paper. Answer **all** questions. For each question there are four possible answers, **A**, **B**, **C** and **D**.
Choose the **one** you consider to be correct and record your choice in **soft pencil** on the separate answer sheet.

Read very carefully the instructions on the answer sheet.

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 included on page 16.

1 A car is driven at constant speed. The brakes apply a uniform acceleration and it c[illegible]t sometime later.

Which graph best illustrates the motion of the car?



2 An object weighs 8.5 N on the Moon. The gravitational field strength on the Moon is 1.7 N / kg

What is the mass of the object?

A 0.2 kg **B** 5.0 kg **C** 6.8 kg **D** 14.5 kg

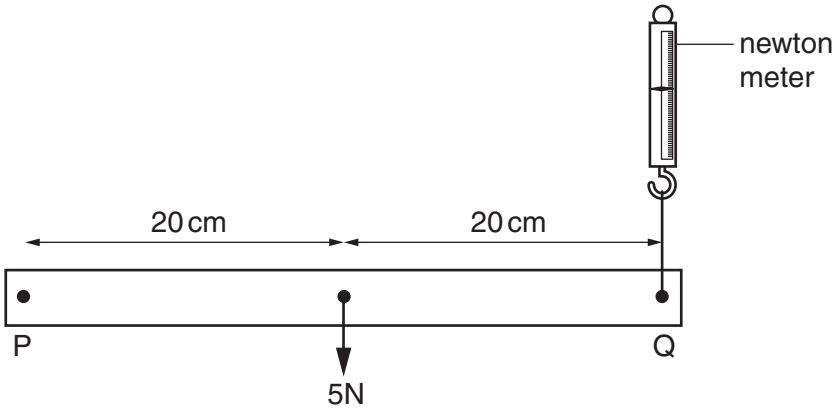
3 In an experiment, to calculate the density of water, a beaker is partly filled with water.

Which mass and volume readings are needed?

	mass of	volume of
A	beaker	beaker
B	beaker	water
C	water	beaker
D	water	water

4 A metal bar, PQ, has a weight of 5 N and is pivoted at P.

It is held horizontal by a newton meter acting at Q.



What is the reading on the newton meter?

A 2.5 N **B** 5 N **C** 8 N **D** 10 N

5 In an energy transformation sequence which of the following produces kinetic energy from gravitational potential energy as part of the sequence?

A burning fuel in a power station

B generating hydroelectric energy

C generating energy in a nuclear power station

D generating energy in a geothermal power station

6 A thermometer uses a physical property that varies with temperature.

Which of the following could **not** be used as the basis for a thermometer?

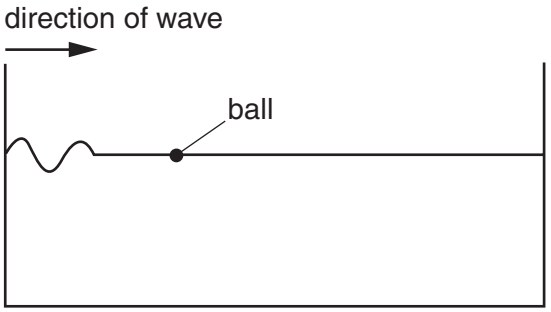
A e.m.f. developed by two metals joined together

B length of a thread of mercury

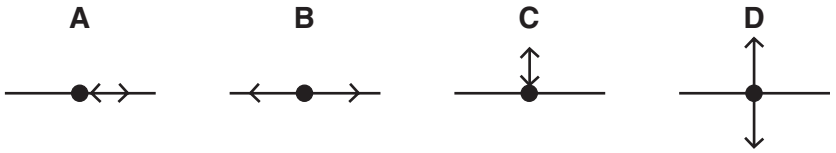
C volume of a fixed mass of air

D weight of a fixed mass of air

7 The diagram shows a ball floating in a tank of water.



Which diagram shows the movement of the ball when the wave passes?



8 Zinc and steel scrap are separated using an electromagnet made of copper wire wound around an iron core.

Which of the materials in this process are non-magnetic?

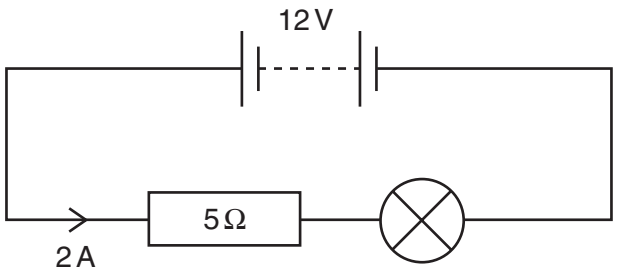
A copper and steel

B copper and zinc

C iron and steel

D iron and zinc

9 The diagram shows the value of various quantities in a circuit.



What is the potential difference across the resistor?

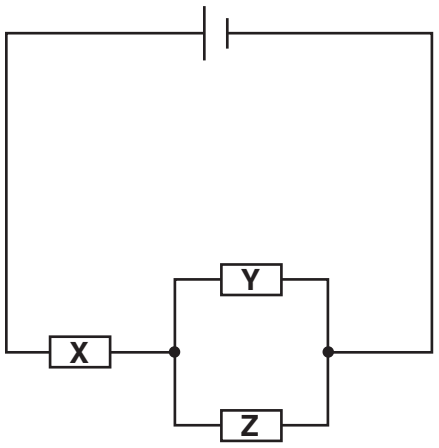
A 2 V

B 5 V

C 10 V

D 12 V

10 The diagram shows a simple d.c. circuit. The resistances of the three resistors **X**, **Y** and **Z** are equal.



The current in

A **Y** is larger than **X** and equal to **Z**.

B **Y** is larger than **X** and larger than **Z**.

C **Y** is smaller than **X** and equal to **Z**.

D **Y** is smaller than **X** and larger than **Z**.

11 A light bulb is marked 120 V, 60 W.

How much energy does one bulb dissipate in one minute?

A 2 J

B 60 J

C 120 J

D 3600 J

12 Why are slip rings used in an a.c. generator?

A They connect the coil to the external circuit.

B They convert mechanical energy into electrical energy.

C They produce the induced e.m.f.

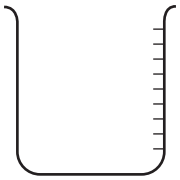
D They reduce the friction so that the coil can turn more easily.

13 When an animal dies, each gram of carbon in its body emits about 16 beta-particles each minute. Some animal remains are discovered that emit about 4 beta-particles each minute from each gram of carbon.

How old are the animal remains, assuming that the half-life of radioactive carbon is 6000 years?

14 Which piece of apparatus is used to measure exactly 22.5 cm^3 of a liquid?

A

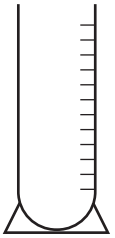


beaker

B

burette

C



measuring cylinder

D

pipette

15 What can be deduced from the symbol $^{4}_{2}He$?

A An atom of helium contains 2 electrons.

B An atom of helium has 2 protons and 4 neutrons in its nucleus.

C Helium has a proton (atomic) number of 4.

D Helium occurs as a diatomic molecule.

16 Substance **X** has the following properties

1 it conducts electricity when molten
2 it has a high melting point
3 it dissolves in an aqueous solution of hydrochloric acid

What is **X**?

A copper

B ethanol

C iodine

D sodium chloride

17 A 6 g sample of pure carbon is completely burned in oxygen.

$$C + O_2 \rightarrow CO_2$$

Which mass of carbon dioxide is produced?

A 12 g

B 22 g

C 38 g

D 44 g

18 Which word describes the reaction between hydrochloric acid and sodium hydroxide?

A electrolysis

B neutralisation

C precipitation

D thermal decomposition

19 Four aqueous solutions have the pH values shown in the table.

solution	P	Q	R	S
pH	2	6	8	10

If pairs of solutions are mixed, which pair **must** produce an acidic mixture?

A P and Q **B** P and R **C** P and S **D** Q and R

20 Which two substances react to form a salt and water only?

A dilute ethanoic acid and aqueous sodium hydroxide

B dilute hydrochloric acid and zinc

C dilute sulphuric acid and aqueous sodium carbonate

D aqueous silver nitrate and aqueous sodium chloride

21 Which arrangement of electrons is that of a gas normally used to fill light bulbs?

A 2 **B** 2, 6 **C** 2, 8, 2 **D** 2, 8, 8

22 What is used to decide the order of the elements in the Periodic Table?

A density

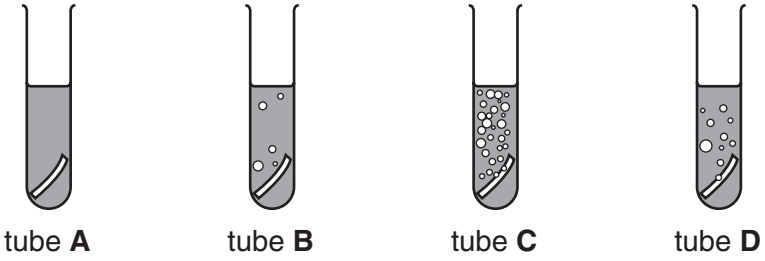
B number of neutrons

C number of protons

D relative atomic mass

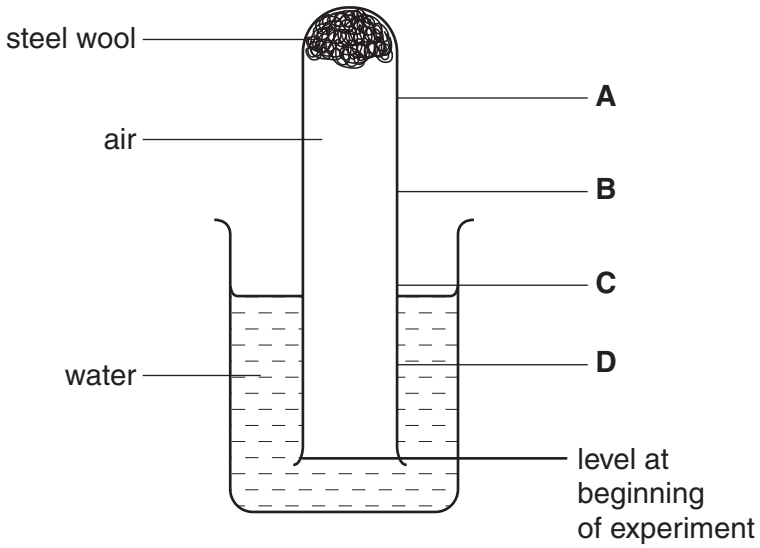
23 The metals iron, lead, magnesium and zinc are each added to dilute hydrochloric acid.

Which tube contains magnesium and dilute hydrochloric acid?



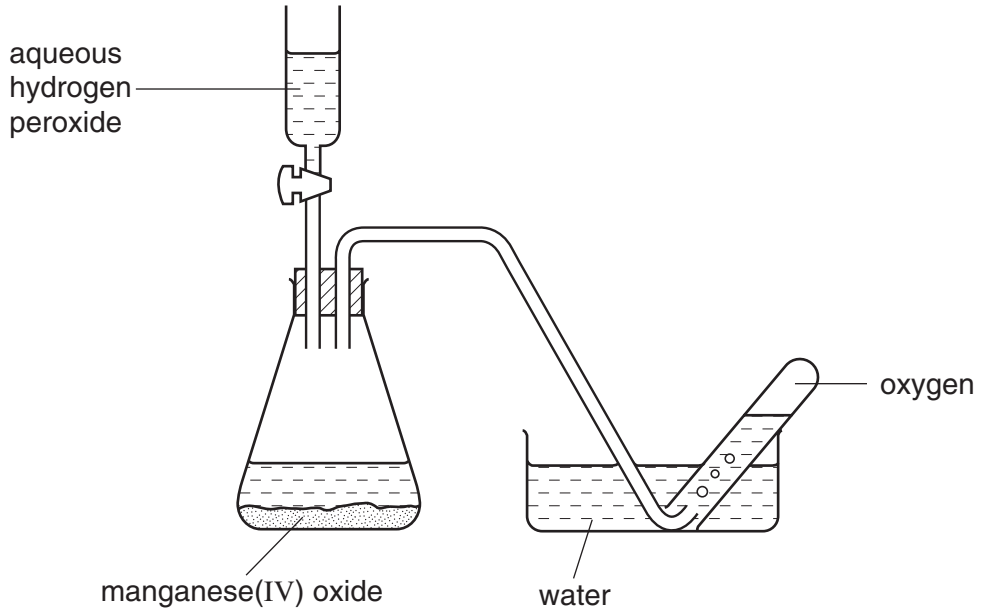
24 The diagram shows steel wool inside a test-tube. The test-tube is inverted in water, trapping air inside.

What will be the water level after several days?



25 Using manganese(IV) oxide as a catalyst, aqueous hydrogen peroxide decomposes to form oxygen.

This reaction was used to make and collect oxygen as shown in the diagram.



The first few test-tubes of collected gas should be rejected because the oxygen would be contaminated by

A air.

B hydrogen.

C hydrogen peroxide.

D manganese(IV) oxide.

26 A sample of polluted air is bubbled through water.

The pH of the solution formed is less than 7.

Which gas causes this?

A ammonia

B carbon monoxide

C nitrogen

D sulphur dioxide

27 When crude oil is distilled, several products are obtained.

What is the correct order of their boiling points?

	lowest boiling point →			highest boiling point
A	diesel	paraffin	petrol	lubricating oil
B	paraffin	petrol	lubricating oil	diesel
C	petrol	paraffin	diesel	lubricating oil
D	petrol	diesel	lubricating oil	paraffin

28 Which structures are present in animal cells?

	cell membrane	cell wall	cytoplasm
A	✗	✔	✔
B	✔	✗	✔
C	✔	✔	✗
D	✔	✔	✔

key

✔ = structure present
✗ = structure absent

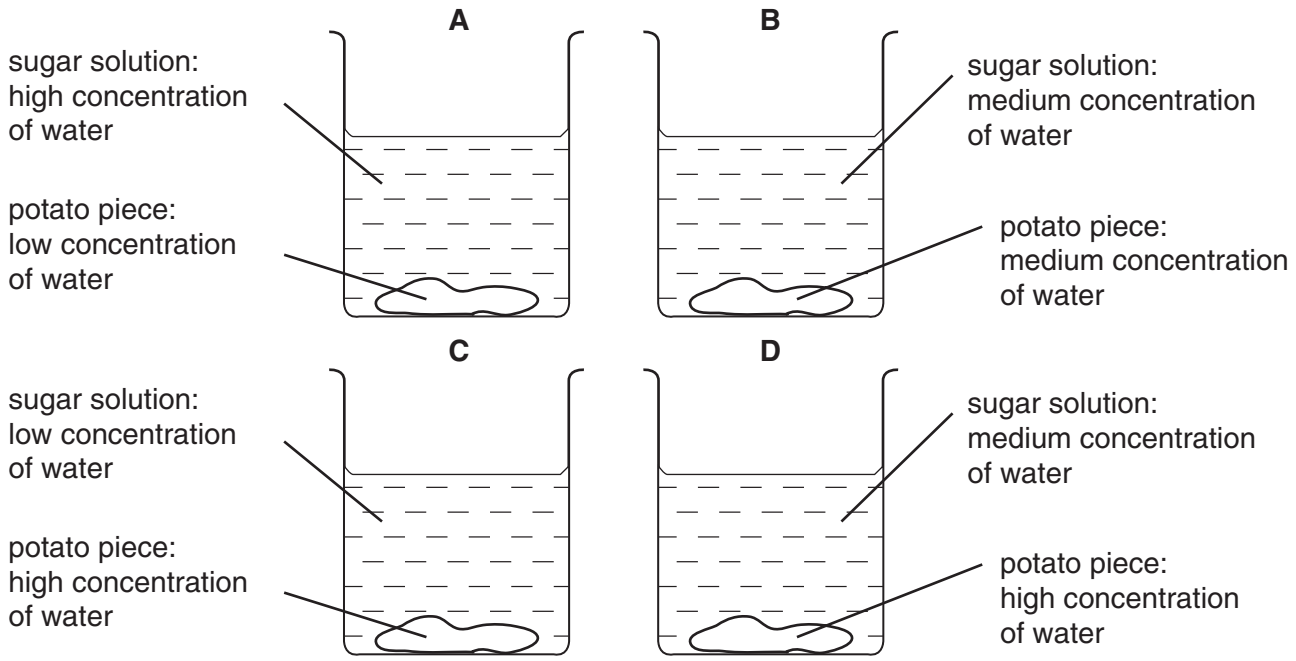
29 The table shows the main functions of red blood cells and root hair cells.

Which row is correct?

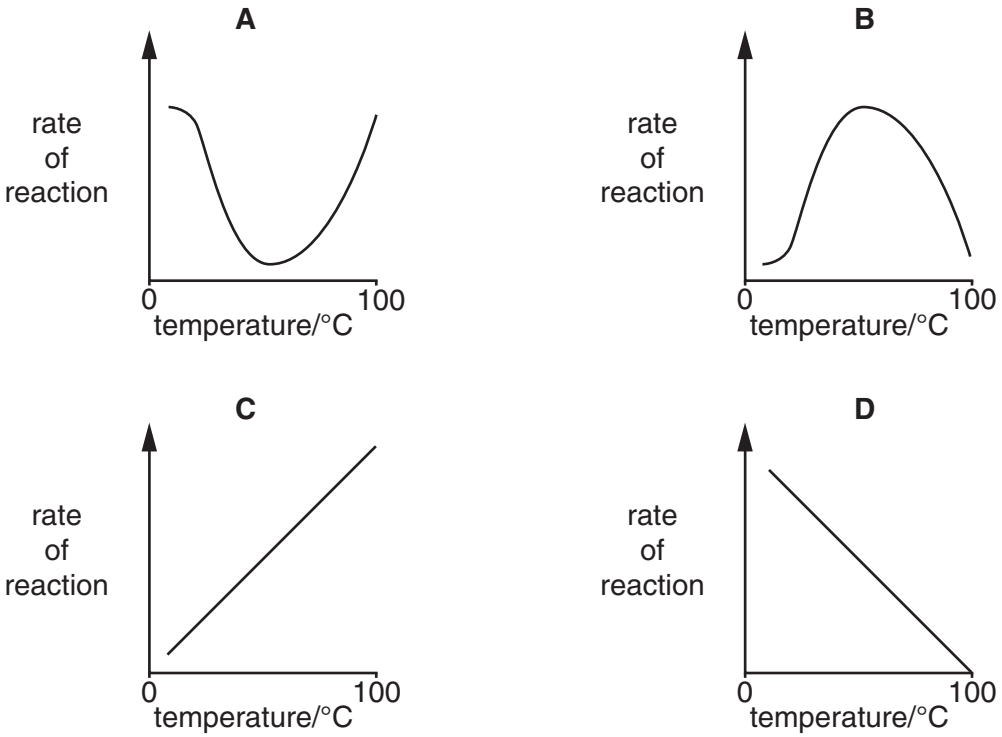
	red blood cell	root hair cell
A	absorption	absorption
B	absorption	transport
C	transport	absorption
D	transport	transport

30 The diagrams show some pieces of potato in four sugar solutions with different conc[illegible] of water.

In which solution will the potato piece take up water from the solution and swell?



31 Which graph shows the effect of temperature on an enzyme-controlled reaction?



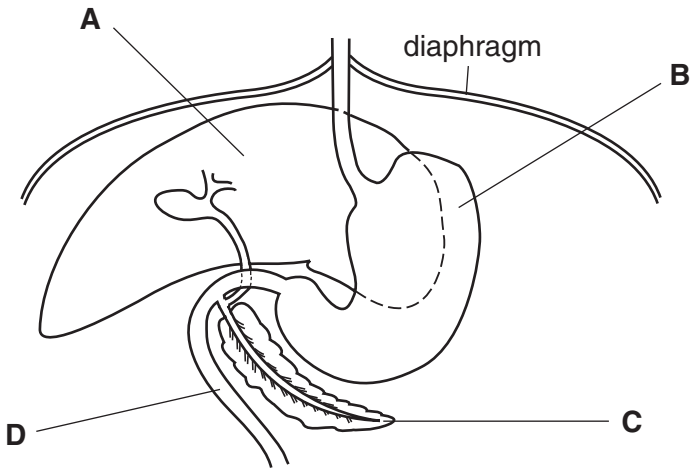
32 The word equation represents the overall chemical reactions of photosynthesis.

Which labelled substance traps light energy?

A carbon dioxide + **B** water $\xrightarrow{\text{**C** chlorophyll}}$ **D** sugar + oxygen

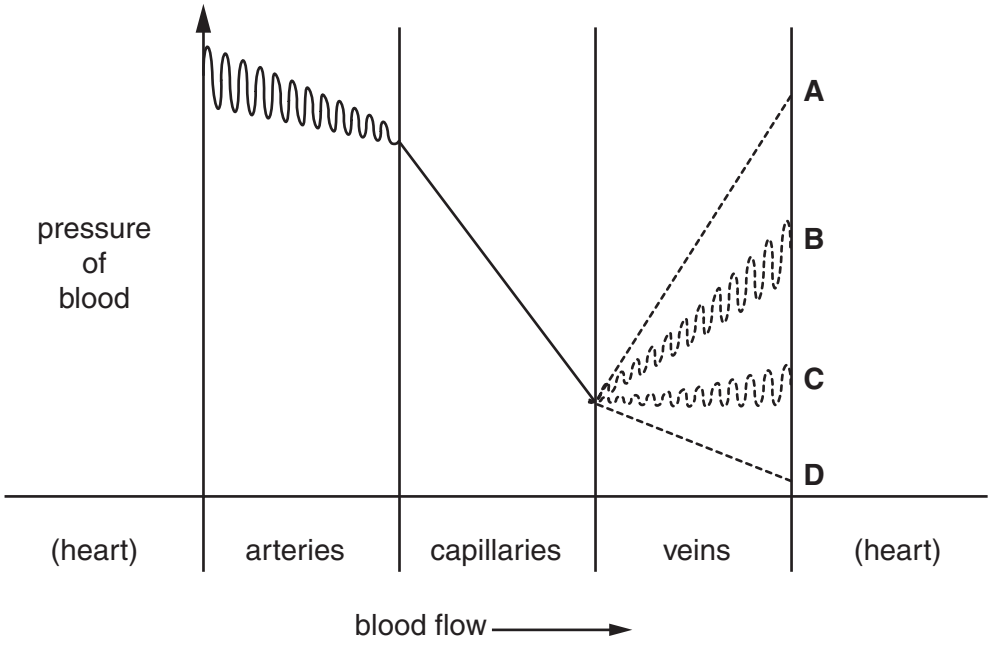
33 The diagram shows part of the human digestive system.

Which part secretes an acidic digestive juice containing a protease?



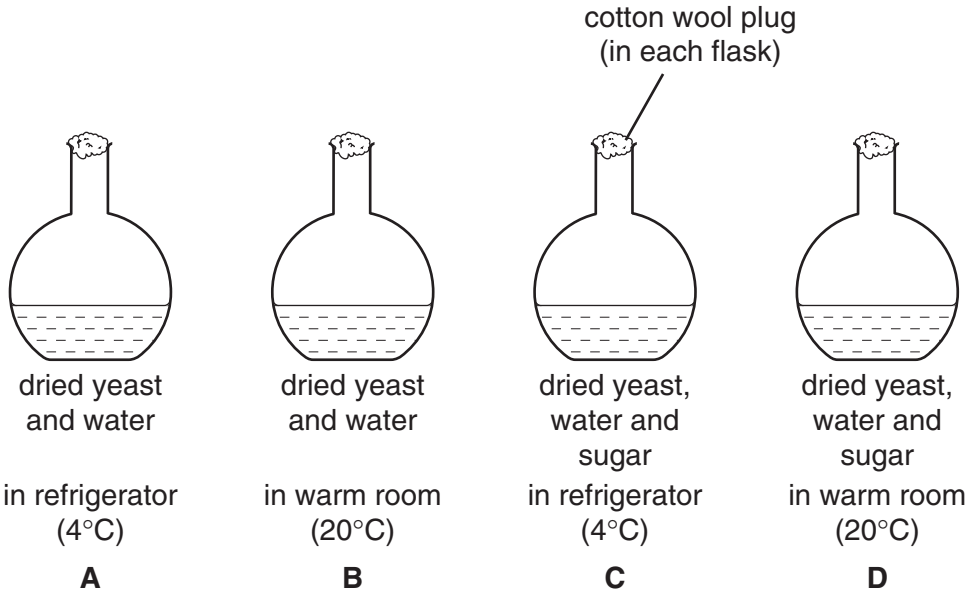
34 The diagram shows the pressure of blood after it leaves the heart and passes through [illegible] then capillaries.

Which dotted line shows the pressure of blood as it flows through veins before returning to the heart?

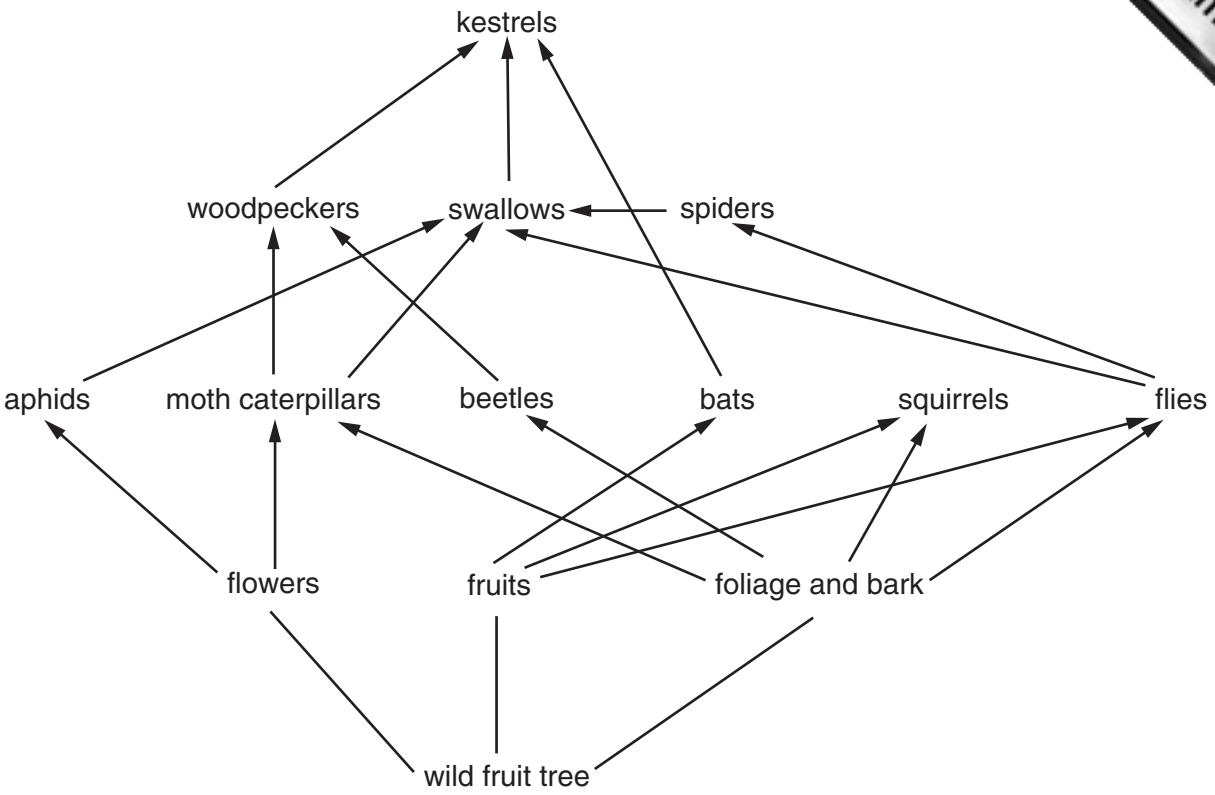


35 Four flasks were sterilised and set up as shown in the diagram.

Which flask will show signs of fermentation (anaerobic respiration) after one hour?



36 The diagram shows a food web on a wild fruit tree.



Which animals would be most affected, if the flowers of the tree were **not** pollinated?

A aphids

B bats

C kestrels

D squirrels

37 When does an ecosystem such as a tropical rainforest absorb or release carbon dioxide?

	in daylight	in darkness
A	absorbs	absorbs
B	absorbs	releases
C	releases	absorbs
D	releases	releases

38 In recent years, important rivers in many parts of the world have become more acidic.

What has caused this change?

A air pollution by sulphur dioxide

B heavy metals

C increased use of insecticides

D increased use of nitrate fertilisers

39 Which structures protect the flower when it is a bud?

A anthers

B carpels

C petals

D sepals

40 What is happening when gametes are released by the human female?

A fertilisation

B implantation

C menstruation

D ovulation

DATA SHEET
The Periodic Table of the Elements

Group																
I	II										III	IV	V	VI	VII	0
							1 H Hydrogen 1									4 He Helium 2
7 Li Lithium	9 Be Beryllium 4										11 B Boron 5	12 C Carbon 6	14 N Nitrogen 7	16 O Oxygen 8	19 F Fluorine 9	20 Ne Neon 10
23 Na Sodium	24 Mg Magnesium 12										27 Al Aluminium 13	28 Si Silicon 14	31 P Phosphorus 15	32 S Sulphur 16	35.5 Cl Chlorine 17	40 Ar Argon 18
39 K otassium	40 Ca Calcium 20	45 Sc Scandium 21	48 Ti Titanium 22	51 V Vanadium 23	52 Cr Chromium 24	55 Mn Manganese 25	56 Fe Iron 26	59 Co Cobalt 27	59 Ni Nickel 28	64 Cu Copper 29	65 Zn Zinc 30	70 Ga Gallium 31	73 Ge Germanium 32	75 As Arsenic 33	79 Se Selenium 34	80 Br Bromine 35	84 Kr Krypton 36
85 Rb ubidium	88 Sr Strontium 38	89 Y Yttrium 39	91 Zr Zirconium 40	93 Nb Niobium 41	96 Mo Molybdenum 42	Tc Technetium 43	101 Ru Ruthenium 44	103 Rh Rhodium 45	106 Pd Palladium 46	108 Ag Silver 47	112 Cd Cadmium 48	115 In Indium 49	119 Sn Tin 50	122 Sb Antimony 51	128 Te Tellurium 52	127 I Iodine 53	131 Xe Xenon 54
133 Cs aesium	137 Ba Barium 56	139 La Lanthanum 57 *	178 Hf Hafnium 72	181 Ta Tantalum 73	184 W Tungsten 74	186 Re Rhenium 75	190 Os Osmium 76	192 Ir Iridium 77	195 Pt Platinum 78	197 Au Gold 79	201 Hg Mercury 80	204 Tl Thallium 81	207 Pb Lead 82	209 Bi Bismuth 83	Po Polonium 84	At Astatine 85	Rn Radon 86
Fr rancium	226 Ra Radium 88	227 Ac Actinium 89 †															

140 Ce Cerium 58	141 Pr Praseodymium 59	144 Nd Neodymium 60	Pm Promethium 61	150 Sm Samarium 62	152 Eu Europium 63	157 Gd Gadolinium 64	159 Tb Terbium 65	162 Dy Dysprosium 66	165 Ho Holmium 67	167 Er Erbium 68	169 Tm Thulium 69	173 Yb Ytterbium 70	175 Lu Lutetium 71
232 Th Thorium 90	Pa Protactinium 91	238 U Uranium 92	Np Neptunium 93	Pu Plutonium 94	Am Americium 95	Cm Curium 96	Bk Berkelium 97	Cf Californium 98	Es Einsteinium 99	Fm Fermium 100	Md Mendelevium 101	No Nobelium 102	Lr Lawrencium 103

3-71 Lanthanoid series
0-103 Actinoid series

y | a / X / b |

a = relative atomic mass
X = atomic symbol
b = proton (atomic) number

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