Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

COMBINED SCIENCE **5129/11**

Paper 1 Multiple Choice **October/November 2018**

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, 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.
DO **NOT** WRITE IN ANY BARCODES.

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 16.
Electronic calculators may be used.

This document consists of **15** printed pages and **1** blank page.

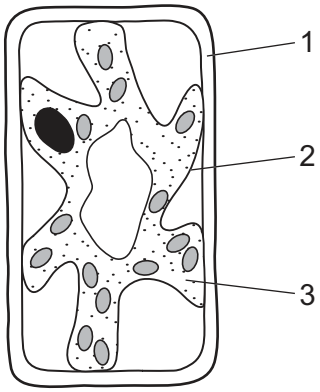
CAMBRIDGE
International Examinations

1 Red blood cells are examples of specialised cells.

What are the surface area to volume ratio and function of a red blood cell?

	surface area to volume ratio	function
A	large	absorption
B	large	transport of oxygen
C	small	absorption
D	small	transport of oxygen

2 The diagram shows a typical plant cell which has been in a concentrated salt solution for ten minutes.



Which numbered structure or structures are partially permeable?

A 1 and 2 **B** 1 and 3 **C** 1 only **D** 2 only

3 Enzymes are biological catalysts which speed up chemical reactions in the body.

What are enzymes made from and are they used up during a reaction?

	made from	used up during reaction
A	lipid	no
B	lipid	yes
C	protein	no
D	protein	yes

4 What is the appearance of a plant that has insufficient nitrogen-containing ions?

A The fruits are rotten.

B The leaves are a very dark green.

C The leaves are pale with poor growth.

D The plant wilts.

5 When a lower jaw moves upwards and downwards and side to side, food is ground into smaller pieces.

What is the name of this process?

A biting

B chewing

C salivating

D swallowing

6 In which plant tissue or tissues is water transported from the roots to the leaves?

A mesophyll only

B phloem and mesophyll

C phloem and xylem

D xylem only

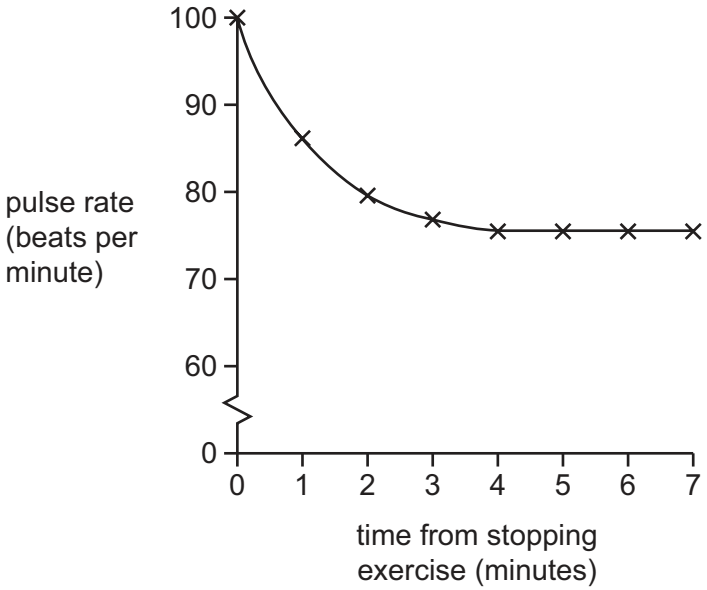
7 A pupil wrote the following sentence.

'Arteries carry blood away from the heart. The pressure in the arteries is .....1..... and the thick wall of .....2..... helps them to withstand the pressure.'

Which words correctly complete gaps 1 and 2?

	1	2
A	high	muscle
B	high	valves
C	low	muscle
D	low	valves

8 The graph shows how the pulse rate of a pupil changes after exercise.



The resting pulse rate before the exercise was 75 beats per minute.

When has all of the lactic acid been broken down?

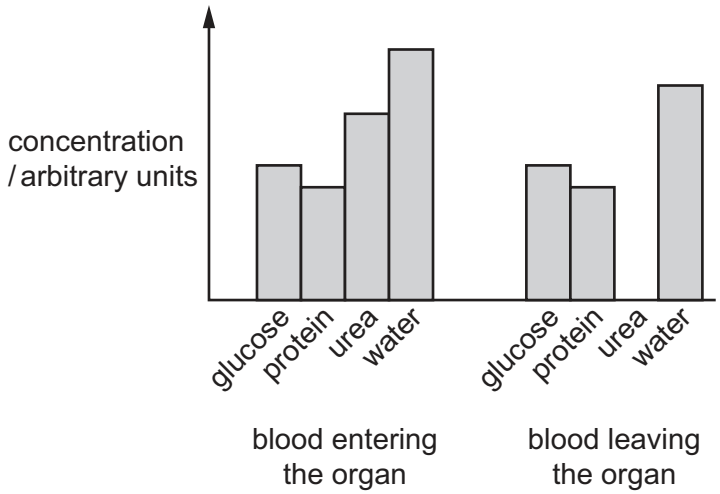
A after 3 minutes

B after 4 minutes

C after 5 minutes

D after 6 minutes

9 Blood was tested for glucose, protein, urea and water before entering an organ and after leaving the same organ. The results are shown on the graph.



What is the organ?

A intestine

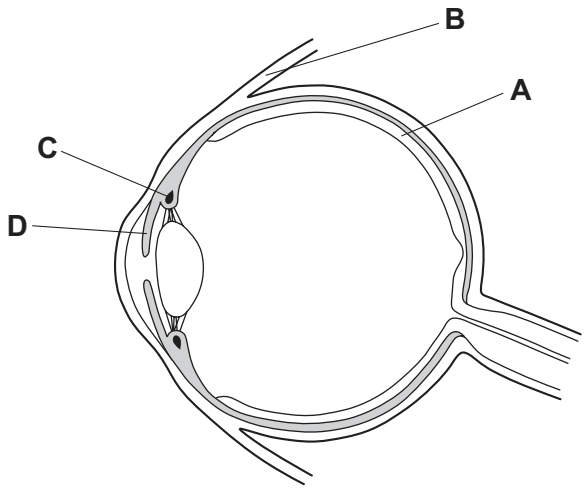
B kidney

C liver

D lungs

10 The diagram shows an eye in section.

Which structure is mainly responsible for changing focus from a distant to a near object?



11 What is a short-term effect of alcohol consumption?

A addiction to alcohol

B brain damage

C liver damage

D slower reaction time

12 What is caused by air pollution?

A breathing difficulties

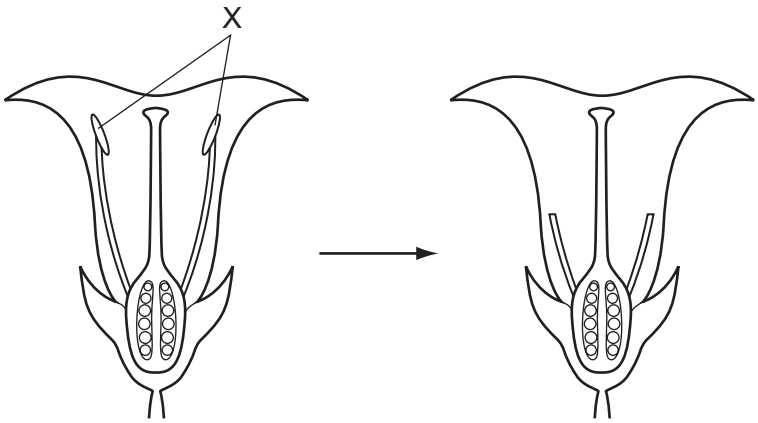
B malnutrition

C HIV

D syphilis

13 The diagram shows a flower.

A plant breeder removed the structures labelled X before they had developed fully.



What is the effect of removing these structures?

A It prevents asexual reproduction.

B It prevents the flower from being pollinated.

C It prevents the flower from pollinating itself.

D It prevents the flower from producing seeds.

14 A student neutralises 25.00 cm^3 of an alkali by adding 18.50 cm^3 of an acid in a titration.

Which pieces of apparatus are used to measure the volumes of acid and alkali?

	acid	alkali
A	burette	pipette
B	measuring cylinder	burette
C	pipette	burette
D	pipette	measuring cylinder

15 Which row about the changes of state is correct?

	solid to liquid	liquid to solid	liquid to gas	gas to liquid
A	freezing	melting	boiling	condensing
B	freezing	melting	condensing	boiling
C	melting	freezing	boiling	condensing
D	melting	freezing	condensing	boiling

16 An isotope of element X is represented by $^{19}_{9}X$.

What is the electronic structure of an atom of X?

A 2,7 **B** 2,8 **C** 2,8,8,1 **D** 2,8,18

17 The table shows some properties of four substances.

Which substance is sodium chloride?

	melting point / °C	ability to conduct electricity when liquid	ability to conduct electricity in aqueous solution
A	–114	none	good
B	180	none	poor
C	808	good	good
D	3550	good	poor

18 Two atoms in a diatomic molecule are held together by a covalent bond.

Which statement is **not** correct?

A Both of the atoms could be from the same non-metallic element.

B One of the atoms could be from a metallic element.

C The outer electron shell of each atom in the molecule is full.

D The two atoms share a pair of electrons.

19 Indium is in Group III of the Periodic Table, the same group as aluminium.

What is the formula of indium oxide?

A InO **B** InO_2 **C** In_2O **D** In_2O_3

20 An incomplete equation is shown.

$$CaCO_3 + 2HNO_3 \rightarrow \text{products}$$

Which formulae complete the equation?

A $CaNO_3 + 2H_2O + CO_2$

B $Ca(NO_3)_2 + H_2O + CO_2$

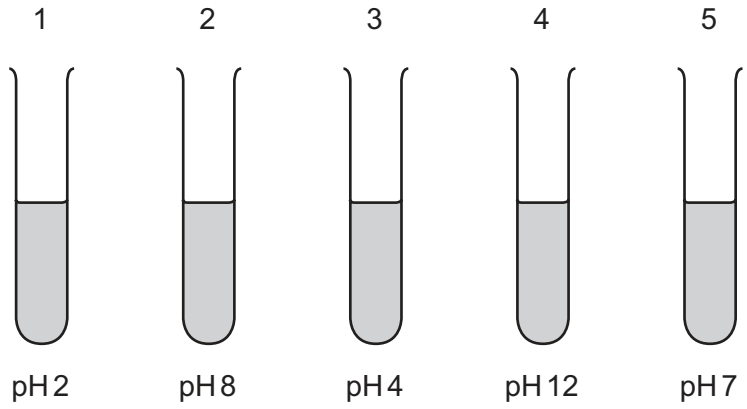
C $Ca(NO_3)_2 + 2H_2O + CO_2$

D $Ca(NO_3)_2 + 2H_2O + 3CO_2$

21 A student tests five solutions to discover which are acidic, alkaline or neutral.

The student tests each solution using Universal Indicator paper to determine the pH.

The results are shown.



Which solutions are acidic?

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

22 Which property determines the order of the elements in the Periodic Table?

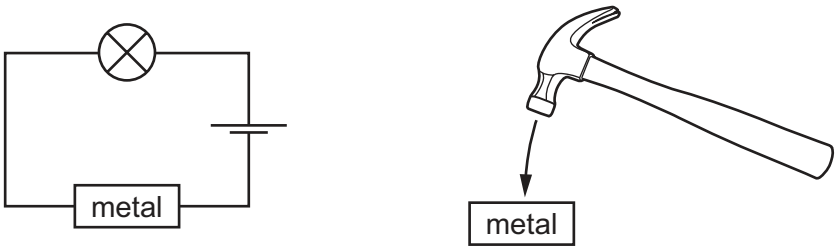
A the masses of their atoms

B the number of electrons in the outer shell

C the number of neutrons in the nucleus

D the number of protons in the nucleus

23 The diagrams show two tests on a piece of metal.



test 1 test 2

What are the results of these tests?

	test 1	test 2
A	lamp does not light	metal breaks into pieces
B	lamp does not light	metal dents but does not break
C	lamp lights	metal breaks into pieces
D	lamp lights	metal dents but does not break

24 Some of the reactions of three metals W, X and Y are shown. The letters are not the chemical symbols of the metals.

metal	reaction with cold water	reaction with steam	reaction with dilute hydrochloric acid
W	reacts	reacts	reacts
X	no reaction		no reaction
Y	reacts		reacts

Which statement is **not** correct?

A W is more reactive than X.

B X reacts with steam.

C Y is more reactive than X.

D Y reacts with steam.

25 Argon, neon, nitrogen and oxygen are all present in clean air.

What is the order of volume composition (%) of these gases in the clean air?

	highest % ⟶			lowest %
A	nitrogen	argon	oxygen	neon
B	nitrogen	oxygen	argon	neon
C	oxygen	neon	nitrogen	argon
D	oxygen	nitrogen	neon	argon

26 Petroleum is separated into fractions by fractional distillation.

Which row shows the uses of four fractions?

	bitumen	oils	paraffin	diesel
A	making waxes	making polish	aircraft fuel	fuel for oil stoves
B	making polish	aircraft fuel	fuel for oil stoves	aircraft fuel
C	making roads	lubricant	aircraft fuel	fuel for lorry engines
D	making roads	lubricant	lubricant	fuel for lorry engines

27 Tricosane is a long chain hydrocarbon. The formula of tricosane is $C_{23}H_{48}$.

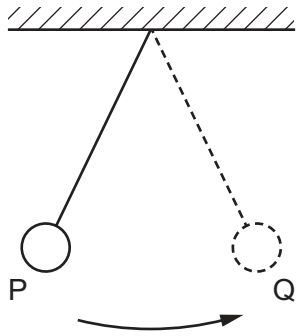
A sample of tricosane is cracked.

Each molecule of tricosane produces a molecule of octane, C_8H_{18}, and three molecules of one other substance.

What is the formula of the other substance?

A C_5H_{10} **B** C_5H_{12} **C** $C_{15}H_{30}$ **D** $C_{15}H_{32}$

28 A simple pendulum swings between points P and Q as shown.



It takes 0.65 seconds to swing from P to Q.

A student measures five complete oscillations of the pendulum.

What time does he record?

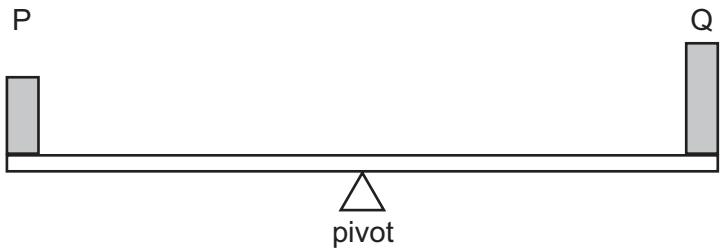
A 1.30 s **B** 3.25 s **C** 6.50 s **D** 13.0 s

29 A block of mass 0.50 kg is pushed across a frictionless surface with a force of 2.0 N.

What is the acceleration of the block?

A 0.25 m / s^2 **B** 1.0 m / s^2 **C** 4.0 m / s^2 **D** 10.0 m / s^2

30 A beam is balanced using two objects, P and Q, at each end.



The pivot is at the centre of the beam.

Which statement is correct?

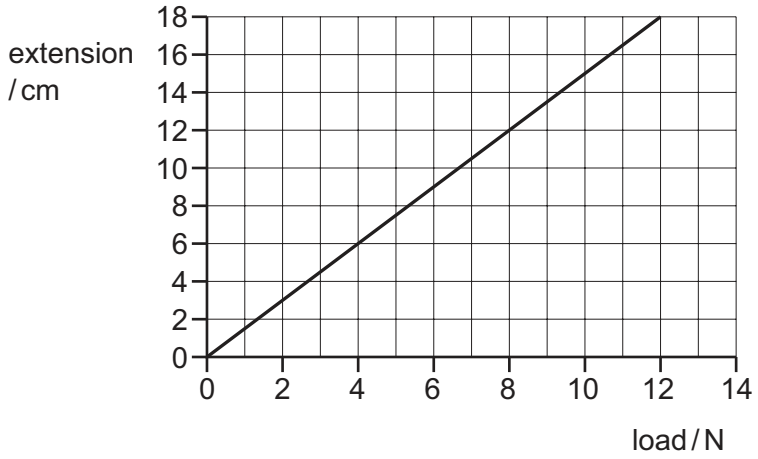
A P and Q have different masses and different weights.

B P and Q have different masses but the same weight.

C P and Q have the same mass and the same weight.

D P and Q have the same mass but different weights.

31 An experiment using a small spring produces the extension-load graph shown.



The length of the small spring with no load is 6.0 cm.

Which load makes its length 18.0 cm?

A 4.0 N **B** 8.0 N **C** 12.0 N **D** 18.0 N

32 Which type of energy is transferred to electrical energy in a simple a.c. generator?

A chemical

B kinetic

C nuclear

D solar

33 Equal volumes of four substances are heated at atmospheric pressure.

The temperature rise is the same for each substance.

Which substance expands the most?

A glass

B mercury

C steam

D water

34 Which row correctly shows examples of transverse and longitudinal waves?

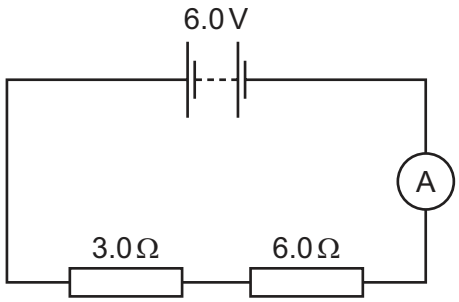
	transverse	longitudinal
A	gamma-rays	water waves
B	infra-red	sound
C	radio	light
D	sound	X-rays

35 A microwave oven heats food using a frequency of 2500 MHz (2.5×10^9 Hz). The speed of microwaves is 3.0×10^8 m / s.

What is the wavelength of the waves used by the oven?

A 0.12 m **B** 0.83 m **C** 1.2 m **D** 8.3 m

36 A battery, two resistors and an ammeter are connected in a series circuit.



Which is the total circuit resistance and the reading on the ammeter?

	total resistance / Ω	ammeter reading / A
A	3.0	0.5
B	3.0	2.0
C	9.0	0.7
D	9.0	1.5

37 A mobile phone (cell phone) takes 4.0 hours to fully recharge from a 5.0 V power supply.

The charging current is 0.25 A.

How much electrical energy is transferred from the power supply?

A 5.0 J **B** 300 J **C** 720 J **D** 18 000 J

38 Which diagram is **not** correct?

A	N S	steel	attract
B	N S	aluminium	no force
C	S N	N S	repel
D	S N	iron	repel

39 Which statement about transformers is correct?

A A constant magnetic field inside the secondary coil induces a voltage across it.

B A current passes through the core.

C A transformer needs a changing current.

D The core of a transformer is made of steel.

40 What does the nucleus of an atom of carbon contain?

A neutrons only

B protons only

C protons and electrons only

D protons and neutrons only

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The Periodic Table of Elements

Group																	
I	II											III	IV	V	VI	VII	VIII
							1 H hydrogen 1										2 He helium 4
3 Li lithium 7	4 Be beryllium 9											5 B boron 11	6 C carbon 12	7 N nitrogen 14	8 O oxygen 16	9 F fluorine 19	10 Ne neon 20
11 Na sodium 23	12 Mg magnesium 24											13 Al aluminium 27	14 Si silicon 28	15 P phosphorus 31	16 S sulfur 32	17 Cl chlorine 35.5	18 Ar argon 40
19 K potassium 39	20 Ca calcium 40	21 Sc scandium 45	22 Ti titanium 48	23 V vanadium 51	24 Cr chromium 52	25 Mn manganese 55	26 Fe iron 56	27 Co cobalt 59	28 Ni nickel 59	29 Cu copper 64	30 Zn zinc 65	31 Ga gallium 70	32 Ge germanium 73	33 As arsenic 75	34 Se selenium 79	35 Br bromine 80	36 Kr krypton 84
37 Rb rubidium 85	38 Sr strontium 88	39 Y yttrium 89	40 Zr zirconium 91	41 Nb niobium 93	42 Mo molybdenum 96	43 Tc technetium –	44 Ru ruthenium 101	45 Rh rhodium 103	46 Pd palladium 106	47 Ag silver 108	48 Cd cadmium 112	49 In indium 115	50 Sn tin 119	51 Sb antimony 122	52 Te tellurium 128	53 I iodine 127	54 Xe xenon 131
55 Cs caesium 133	56 Ba barium 137	57–71 lanthanoids	72 Hf hafnium 178	73 Ta tantalum 181	74 W tungsten 184	75 Re rhenium 186	76 Os osmium 190	77 Ir iridium 192	78 Pt platinum 195	79 Au gold 197	80 Hg mercury 201	81 Tl thallium 204	82 Pb lead 207	83 Bi bismuth 209	84 Po polonium –	85 At astatine –	86 Rn radon –
87 Fr francium –	88 Ra radium –	89–103 actinoids	104 Rf rutherfordium –	105 Db dubnium –	106 Sg seaborgium –	107 Bh bohrium –	108 Hs hassium –	109 Mt meitnerium –	110 Ds darmstadtium –	111 Rg roentgenium –	112 Cn copernicium –		114 Fl flerovium –		116 Lv livermorium –		

Key

atomic number
atomic symbol
name
relative atomic mass

lanthanoids	57 La lanthanum 139	58 Ce cerium 140	59 Pr praseodymium 141	60 Nd neodymium 144	61 Pm promethium –	62 Sm samarium 150	63 Eu europium 152	64 Gd gadolinium 157	65 Tb terbium 159	66 Dy dysprosium 163	67 Ho holmium 165	68 Er erbium 167	69 Tm thulium 169	70 Yb ytterbium 173	71 Lu lutetium 175
actinoids	89 Ac actinium –	90 Th thorium 232	91 Pa protactinium 231	92 U uranium 238	93 Np neptunium –	94 Pu plutonium –	95 Am americium –	96 Cm curium –	97 Bk berkelium –	98 Cf californium –	99 Es einsteinium –	100 Fm fermium –	101 Md mendelevium –	102 No nobelium –	103 Lr lawrencium –

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