

Cambridge International Examinations

Cambridge Ordinary Level

COMBINED SCIENCE 5129/11

Paper 1 Multiple Choice October/November 2014

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.







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1 Cell P and cell Q are animal cells.

Cell P is placed into a concentrated salt solution.

Cell Q is placed into distilled (pure) water.

What is the appearance of the two cells after ten minutes?

	cell P	cell Q
Α	burst	burst
В	burst	shrivelled
С	shrivelled	burst
D	shrivelled	shrivelled

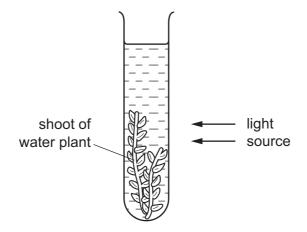
2 Every seed contains a food reserve.

What makes this food available to the young plant at germination?

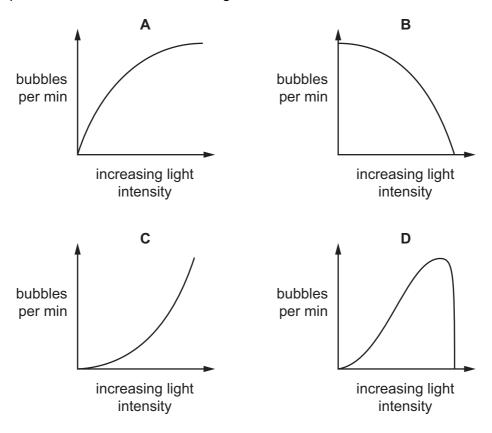
- A cellulose
- **B** chlorophyll
- **C** enzymes
- **D** lactic acid

3 The diagram shows an investigation into the effect of light intensity on the rate of photosynthesis. The rate is measured by counting the number of bubbles released per minute.

The experiment is repeated using different light intensities.



Which graph shows the result of the investigation?



- 4 Which statement describes the effect of a lack of nitrogen on plants?
 - A faster root growth and purple leaves
 - **B** faster root growth and yellow leaves
 - **C** poor plant growth and purple leaves
 - **D** poor plant growth and yellow leaves

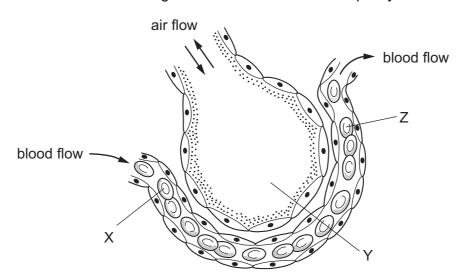
5 When a child sucks a sweet it may stay in their mouth for some time.

How does this contribute to tooth decay?

- A The sugar in the sweet stops bacteria from growing.
- **B** The teeth are damaged by acid being produced in the mouth.
- **C** The teeth are damaged by alkali being produced in the mouth.
- **D** The teeth are damaged by artificial flavourings in the sweet.
- 6 Which row does **not** correctly link a component of blood and its function?

	component of blood	function
Α	plasma	transports urea
В	platelets	blood clotting
С	red blood cells	transport oxygen
D	white blood cells	transport CO ₂

7 The diagram shows a section through an alveolus and a blood capillary.



Which row describes the oxygen concentrations at X, Y and Z?

	X	Y	Z
Α	high	low	high
В	high	low	low
С	low	high	high
D	low	high	low

8	What is the excretory	product in blood that is removed by	the lunas?
•	VVII at 10 ti 10 0x010to1	product in blood that is rollieved by	uno iangi

- A carbon dioxide
- **B** glucose
- C lactic acid
- **D** urea
- 9 Which processes take place in the eye when a person moves into dim light?

	size of pupil	circular muscles of iris	radial muscles of iris
Α	enlarges	contract	relax
В	enlarges	relax	contract
С	reduces	contract	relax
D	reduces	relax	contract

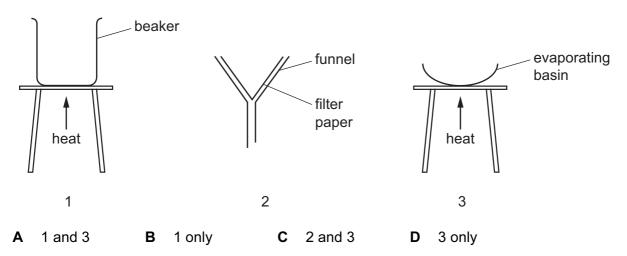
- 10 What is **not** an effect of excessive alcohol consumption?
 - **A** addiction
 - **B** depression
 - C lack of self control
 - D quicker reaction times
- **11** What is the main source of energy for food webs?
 - A chemical reactions
 - **B** heat from the centre of the Earth
 - **C** heat from the Sun
 - **D** light from the Sun
- 12 Which are results of deforestation in tropical rainforests?
 - A increased atmospheric carbon dioxide and decreased biodiversity
 - **B** increased atmospheric carbon dioxide and increased biodiversity
 - **C** increased atmospheric oxygen and decreased biodiversity
 - D increased atmospheric oxygen and increased biodiversity

13 Which combination of factors is least likely to stop menstruation?

	diet	stress
Α	balanced	high
В	balanced	low
С	unbalanced	high
D	unbalanced low	

14 Powdered magnesium carbonate is slowly added to dilute sulfuric acid.

Which pieces of apparatus are needed to continue the experiment to obtain a sample of magnesium sulfate crystals?



15 An atom of sodium is represented by $^{23}_{11}$ Na.

What are the numbers of neutrons and protons in this atom?

	number of neutrons	number of protons
Α	11	12
В	12	11
С	23	11
D	23	12

16 Which atom forms an ion with a charge of 2+?

	proton (atomic) number
Α	6
В	8
С	12
D	16

17 The table shows the electronic structure of four elements.

element	electronic structure
W	2,6
X	2,8
Y	2,8,1
Z	2,8,7

Which pair of atoms form a covalent molecule?

- A two atoms of W
- **B** two atoms of X
- **C** an atom of W and an atom of X
- **D** an atom of Y and an atom of Z

18 Which formula has the greatest number of atoms?

- **A** Ca₃(PO₄)₂
- B Cu(CH₃COO)₂
- **C** $Fe_2(SO_4)_3$
- **D** $(NH_4)_2CO_3$
- 19 An element forms an amphoteric oxide.

Which substances will react with this amphoteric oxide?

	acids	alkalis	
Α	✓	✓	key
В	✓	X	✓ = reacts
С	X	✓	x = does not react
D	X	X	

20 An element X from Period 2 in the Periodic Table is heated in air.

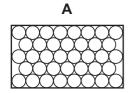
It forms an oxide which dissolves in water.

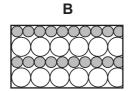
Universal Indicator added to the solution turns blue.

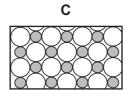
Which row describes element X?

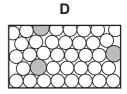
	metal or non-metal	position in the period
Α	metal	on the left side
В	metal	on the right side
С	non-metal	on the left side
D	non-metal	on the right side

21 Which diagram represents the structure of an alloy?









22 Part of the reactivity series of metals is given below.

barium

calcium

magnesium

chromium

iron

copper

palladium

platinum

Which statement is **not** correct?

- A Barium will not react with cold water but will react with steam.
- **B** Chromium will react with dilute hydrochloric acid.
- C Palladium will not react with cold water or steam.
- **D** Platinum will not react with dilute hydrochloric acid.

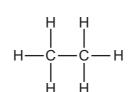
- 23 Which two gases are both pollutants of the atmosphere?
 - A carbon monoxide and oxygen
 - B carbon monoxide and sulfur dioxide
 - C nitrogen and oxygen
 - D nitrogen and sulfur dioxide
- 24 Ammonia is made in the Haber process.

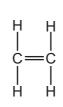
Which conditions are used in the Haber process?

	temperature /°C	pressure /atm	catalyst
Α	200	450	aluminium oxide
В	200	450	iron
С	450	200	aluminium oxide
D	450	200	iron

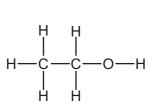
25 The diagrams show the structures of four organic molecules.

H—C—O—H





R



S

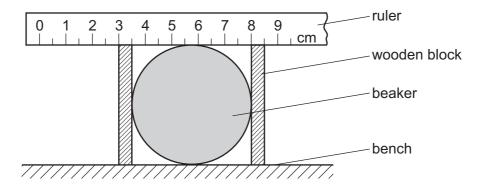
Which two are members of the same homologous series?

- A P and R
- **B** P and S
- **C** Q and R
- **D** R and S
- 26 Which statement about alkenes is **not** correct?
 - A Alkenes are made by cracking.
 - **B** Alkenes are saturated compounds.
 - **C** Alkenes contain carbon-carbon double bonds.
 - **D** Alkenes turn bromine water colourless.

27 The properties of ethanol make it a very useful substance.

Which statement is **not** correct?

- A Ethanol burns to form carbon dioxide and water and is often used as a fuel.
- **B** Ethanol can be formed from sugar and is found in wine.
- **C** Ethanol is a useful solvent because it is able to dissolve many different substances.
- **D** Ethanol is very slippery and so is used as a lubricant.
- 28 The diagram shows a method of measuring the diameter of a beaker.



What is the diameter of the beaker?

- **A** 4.5 cm
- **B** 5.0 cm
- **C** 5.5 cm
- **D** 8.0 cm
- 29 The gradient of the line on a graph gives the acceleration of a moving object.

What are the quantities on the horizontal and vertical axes of this graph?

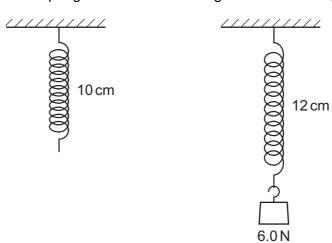
	quantity on horizontal axis	quantity on vertical axis		
A speed		distance		
В	speed	time		
С	time	distance		
D	time	speed		

30 An unbalanced force is applied to a moving object.

Which statement does **not** describe the possible motion of the object?

- A the object accelerates
- **B** the object's direction alters
- **C** the object's speed decreases
- **D** the object's velocity remains constant

31 The diagrams show how a spring extends when a weight of 6.0 N is hung on it.

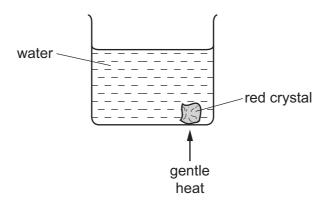


Which weight hanging from the spring causes the length to become 15 cm?

- **A** 7.5 N
- **B** 15N
- **C** 30 N
- **D** 45 N
- 32 Which type of energy is converted to thermal energy when atoms combine?
 - A chemical
 - **B** kinetic
 - C nuclear
 - **D** solar

33 A beaker of water contains a red crystal which is slowly dissolving.

Gentle heat is applied below the crystal.



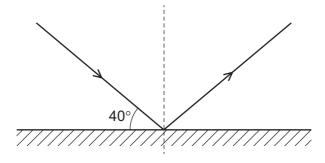
The red colour rises.

What is the name of this process?

- **A** conduction
- **B** convection
- **C** evaporation
- **D** radiation
- 34 Which line in the table shows examples of transverse and longitudinal waves?

	transverse	longitudinal				
Α	gamma-rays	s light				
В	infra-red	sound				
С	radio	water waves				
D	sound	X-rays				

35 The ray diagram shows light reflecting off a plane mirror.



What is the angle between the incident and reflected rays?

- **A** 40°
- **B** 50°
- **C** 80°
- **D** 100°

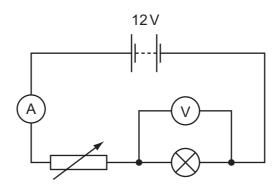
36 The diagram shows four charged objects, P, Q, R and S.



It is found that P attracts R but repels S.

Which statement is correct?

- A Q attracts R.
- B Q repels S.
- C R attracts S.
- **D** R repels S.
- 37 The circuit shown is used to determine the resistance of a lamp for two different brightness settings.



When the lamp brightness is low, the voltmeter reading is 2V and the ammeter reading is 2A.

When the lamp brightness is normal, the readings are 12 V and 4 A.

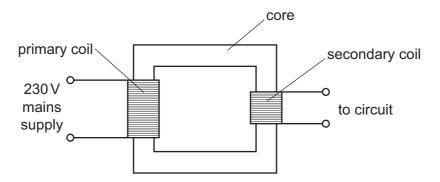
What was the increase in filament resistance?

- A 1Ω
- **B** 2Ω
- \mathbf{C} 3 Ω
- **D** 4Ω
- **38** A 750 W microwave oven is used in a house where the mains voltage is 240 V.

Which fuse should be used in the plug?

- **A** 3A
- **B** 5A
- **C** 10 A
- **D** 13A

39 The diagram shows a transformer.



There is a current in the primary coil and another current in the secondary coil.

Why is there a current in the secondary coil?

- A because electricity is conducted through the core
- **B** because the current in the primary coil does not change
- C because there are more turns on the primary coil than on the secondary coil
- **D** because there is a changing magnetic field in the core
- **40** The count rate produced by a source containing a radioactive nuclide falls from 1200 to 75 in 3 minutes.

What is the half-life of the radioactive nuclide?

- A 0.75 minutes
- **B** 1.0 minutes
- C 3.0 minutes
- **D** 12.0 minutes

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DATA SHEET
The Periodic Table of the Elements

	0	4 He Helium	Ne Neon 10 Neon 10 Argon 18	84 Kry pton 36	131 Xe Xenon 54	Rn Radon 86		Lu Lutetium 71	Lr Lawrencium 103
	IIA		19 Fluorine 9 35.5 C1	80 Br Bromine 35	127 I lodine 53	At Astatine 85		173 Yb Ytterbium 70	Nobelium 102
	IN		16 Oxygen 8 32 Su ffur 16	Selenium 34	128 Te Tellurium 52	Po Polonium 84		169 Tm Thulium	Md Mendelevium 101
	^		14 Nitrogen 7 31 97 Phosphorus 15	75 AS Arsenic 33	Sb Antimony 51	209 Bi Bismuth 83		167 Er Erbium 68	Fm Fermium
	//		12 Carbon 6 Carbon 8 Silicon 14	73 Ge Germanium 32	119 Sn Tin	207 Pb Lead 82		165 Ho Holmium 67	ES Einsteinium 99
	Ш		11 B Boron 5 27 A A 1 Abuminium	70 Ga Gallium 31	115 In Indium 49	204 T t Thallium 81		162 Dy Dysprosium 66	Cf Californium 98
				65 Zn Zinc 30	112 Cd Cadmium 48	201 Hg Mercury 80		159 Tb Terbium 65	BK Berkelium 97
				64 Copper Copper 29	108 Ag Silver 47	197 Au Gold		157 Gd Gadolinium 64	Carium Ourium
				59 N ickel	106 Pd Palladium 46	195 Pt Platinum 78		152 Eu Europium 63	Am Americium 95
			1	59 Cobalt	Rh Rhodium 45	192 Ir Iridium		Sm Samarium 62	Pu Plutonium
		T Hydrogen		56 Fe Iron	Ru Ruthenium 44	190 Os Osmium 76		Pm Promethium 61	Neptunium 93
				Mn Manganese 25	Tc Technetium 43	186 Re Rhenium 75		Neodymium 60	238 U Uranium 92
				52 Cr Chromium 24	96 Mo Molybdenum 42	184 W Tungsten 74		Pr Praseodymium 59	Pa Protactinium 91
			_	51 V Vanadium 23	93 Nb Niobium 41	181 Ta Tantalum 73		140 Ce	232 Th Thorium 90
			_	48 T Titanium 22	2r Ziroonium 40	178 Hf Hafnium *			mic mass nbol nic) number
				Scandium 21	89 Y Yttrium 39	139 La Lanthanum 57 ,	AC Actinium 89	d series series	a = relative atomic mass X = atomic symbol b = proton (atomic) number
	=		9 Be Beryllium 4 24 Mg Magnesium 12	40 Ca Calcium	Strontium 38	137 Ba Barium 56	226 Ra Radium 88	*58-71 Lanthanoid series	<i>a</i> × <i>a</i>
	_		7 Lithium 3 23 Na Sodium 11	39 K Potassium	Rb Rubidium	133 Cs Caesium 55	Fr Francium 87	*58-71 L	Key

The volume of one mole of any gas is 24 dm³ at room temperature and pressure (r.t.p.).

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