



**COMBINED SCIENCE**

**5129/11**

Paper 1 Multiple Choice

**May/June 2017**

**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.

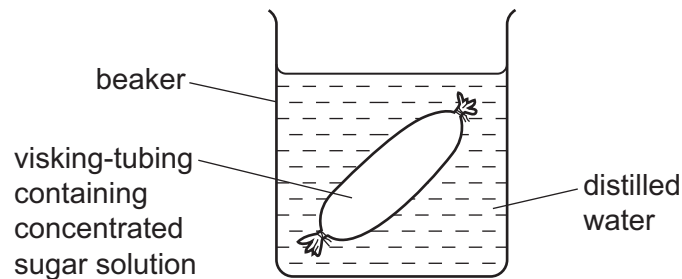
This document consists of **14** printed pages and **2** blank pages.

1 Which structures are found in both animal and plant cells?

- A cell membrane, cytoplasm and cell wall
- B chloroplasts, cytoplasm and cell wall
- C cytoplasm, cell membrane and nucleus
- D nucleus, cell wall and sap vacuole

2 Visking tubing is a partially permeable membrane.

Some visking tubing containing a concentrated sugar solution is weighed and placed in distilled water, as shown.



After 2 hours the visking tubing is removed and reweighed.

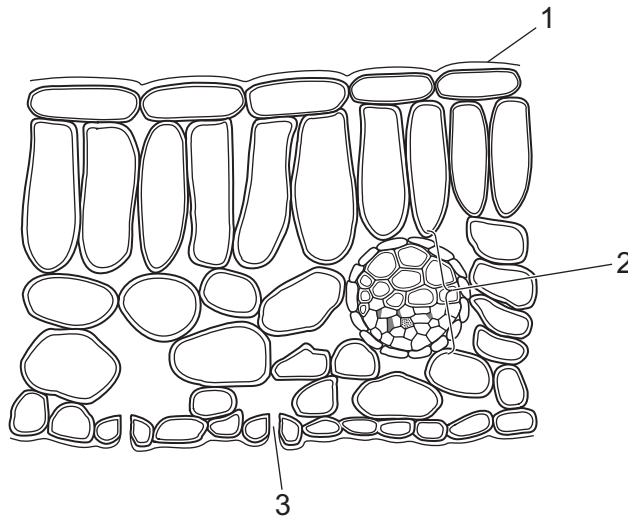
What happens to the mass and why?

- A It decreases because sugar moves out.
  - B It decreases because water moves out.
  - C It increases because sugar moves in.
  - D It increases because water moves in.
- 3 Amylase is an enzyme important in seed germination.

What is the function of amylase in seed germination?

- A It breaks the testa so the plumule can emerge.
- B It causes the radical to elongate.
- C It changes the stored starch into sugars for respiration.
- D It helps the seed absorb water to rehydrate the cells.

4 The diagram shows a cross-section of a leaf.



What are the parts labelled 1, 2 and 3?

	1	2	3
<b>A</b>	cuticle	chloroplast	vascular bundle
<b>B</b>	cuticle	vascular bundle	stomata
<b>C</b>	mesophyll	chloroplast	vascular bundle
<b>D</b>	mesophyll	vascular bundle	stomata

5 What is the role of fat in the human body?

- A** to form glycogen
- B** to form urea
- C** to provide amino acids
- D** to provide a source of energy

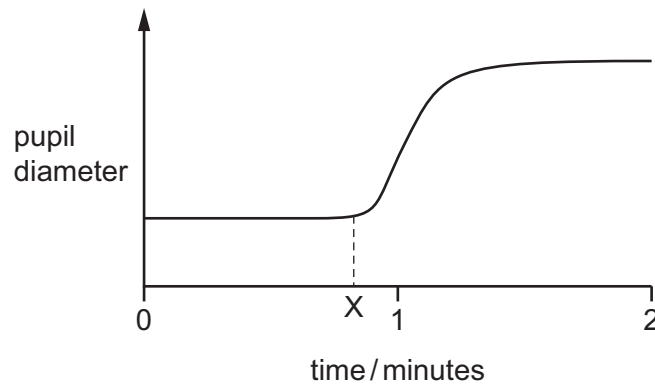
6 Which definition of transpiration is correct?

- A** loss of water by evaporation from the cuticle
- B** loss of water by evaporation from the stomata
- C** loss of water by osmosis from the cuticle
- D** loss of water by osmosis from the stomata

- 7 What is most likely to reduce the chance of suffering from coronary heart disease?
- A drinking more alcohol
  - B eating more animal fat
  - C giving up smoking
  - D taking less exercise
- 8 What is produced by anaerobic respiration in a muscle cell during exercise?
- A carbon dioxide and lactic acid
  - B carbon dioxide and water
  - C carbon dioxide only
  - D lactic acid only
- 9 Which row shows where carbon dioxide and urea are excreted from the body?

	carbon dioxide	urea
<b>A</b>	kidneys	kidneys
<b>B</b>	kidneys	liver
<b>C</b>	lungs	kidneys
<b>D</b>	lungs	liver

- 10 The graph shows how the diameter of the pupil of a person's eye changes during the course of two minutes.



What happens to the light intensity and the pupil diameter immediately after time X?

	light intensity	pupil diameter
<b>A</b>	decreases	decreases
<b>B</b>	decreases	increases
<b>C</b>	increases	decreases
<b>D</b>	increases	increases

- 11 Which part of the body is most likely to be directly damaged by drinking too much alcohol?

- A** the eyes
- B** the ileum
- C** the liver
- D** the lungs

- 12 Which human activity has caused most damage to tropical rain forests?

- A** burning fossil fuels
- B** flooding of land
- C** logging for timber
- D** searching for medicinal plants

- 13** A person suffers from pain when urinating. The cause of this symptom is a bacterial infection which can be treated using antibiotics.

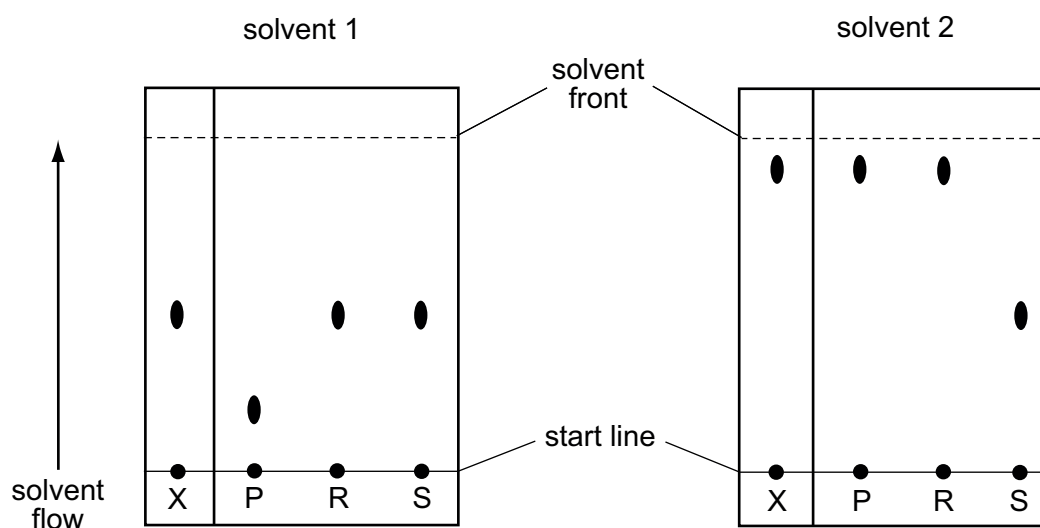
If left untreated, the disease can cause infertility or can be passed to an unborn child.

Which two diseases could both be the disease described?

- A** coronary heart disease and HIV  
**B** gonorrhoea and syphilis  
**C** HIV and gonorrhoea  
**D** syphilis and HIV
- 14** Solution X contains one or more of three substances P, R or S.

Two chromatograms, to compare X with each of the three substances, are obtained using different solvents.

The results are shown.



What does X contain?

- A** P only      **B** R only      **C** P and R      **D** R and S
- 15** Which statement describes the particles in a liquid?
- A** They are separate from each other and move randomly in all directions.  
**B** They are separate from each other and vibrate forwards and backwards.  
**C** They touch each other and move randomly in all directions.  
**D** They touch each other and vibrate forwards and backwards.

16 Which statement about isotopes of the same element is correct?

- A They have different atomic numbers.
- B They have different chemical reactivities.
- C They have different nucleon numbers.
- D They have different numbers of electrons.

17 A particle has 10 electrons, 7 protons and 8 neutrons.

What is the symbol for the particle?

- A  $\text{N}^{3-}$
- B  $\text{O}^{2-}$
- C  $\text{F}^-$
- D Ne

18 Which row describes most covalently bonded compounds?

	electrical conductivity when solid	melting point
A	conducts	high
B	conducts	low
C	insulator	high
D	insulator	low

19 What is the total number of atoms in  $(\text{C}_2\text{H}_5)_2\text{O}$ ?

- A 3
- B 9
- C 13
- D 15

20 The pH values of three solutions are shown.

	pH
ethanoic acid	6
hydrochloric acid	1
iron(III) chloride	3

What is the order of acidity of these solutions, from most acidic to least acidic?

- A ethanoic acid, hydrochloric acid, iron(III) chloride
- B ethanoic acid, iron(III) chloride, hydrochloric acid
- C hydrochloric acid, ethanoic acid, iron(III) chloride
- D hydrochloric acid, iron(III) chloride, ethanoic acid

21 Which statement about the elements in Group VII of the Periodic Table is **not** correct?

- A The melting points decrease down the group.
- B They are non-metals.
- C They exist as diatomic molecules.
- D They form ionic compounds with Group I elements.

22 Platinum is a metal.

Which statements about platinum are correct?

- 1 It can be hammered into shape.
- 2 It conducts heat.
- 3 It has a low boiling point.
- 4 It is shiny.
- 5 It is strong.

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

23 Four different metals are reacted separately with cold water, steam and dilute hydrochloric acid.

The results are shown.

metal	cold water	steam	dilute hydrochloric acid
W	no reaction	reacts slowly	reacts vigorously
X	no reaction	no reaction	reacts slowly
Y	reacts slowly	reacts vigorously	reacts explosively
Z	reacts slowly	reacts slowly	reacts vigorously

What is the order of reactivity of the four metals?

	least reactive $\longrightarrow$ most reactive			
<b>A</b>	X	W	Z	Y
<b>B</b>	X	Z	W	Y
<b>C</b>	Y	W	Z	X
<b>D</b>	Y	Z	W	X



24 Polluted air is bubbled through distilled water at room temperature to form a solution.

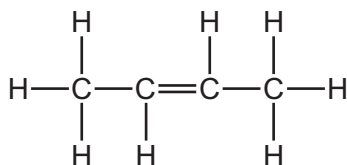
Solid sodium carbonate is added to the solution and bubbles of gas are produced.

Which pollutant could be present in the air?

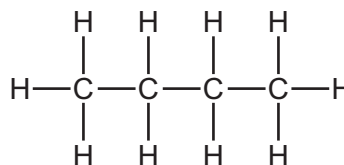
- A a lead compound
- B carbon dioxide
- C carbon monoxide
- D sulfur dioxide

25 Which structure does **not** represent  $C_4H_8$ ?

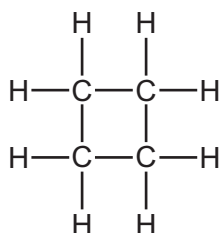
A



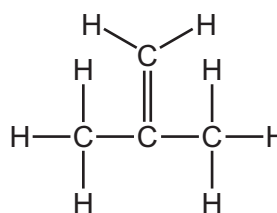
B



C



D



26 Which compound would **not** decolourise bromine water?

- A  $C_2H_4$
- B  $C_2H_6$
- C  $C_3H_6$
- D  $C_4H_8$

27 Two reactions are used to manufacture ethanol.

reaction 1    fermentation

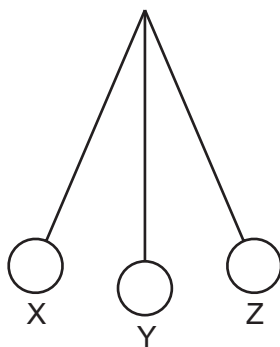
reaction 2    addition of steam to ethene

Which statement is **not** correct?

- A Reaction 1 requires a catalyst.
- B Reaction 1 works at room temperature.
- C Reaction 2 requires a catalyst.
- D Reaction 2 works at room temperature.

28 A pendulum is repeatedly swinging from X through Y to Z and back again to X.

It takes 1 s to swing from X to Y.



How many periods of the pendulum are completed in 60 s?

- A 15                      B 20                      C 30                      D 60

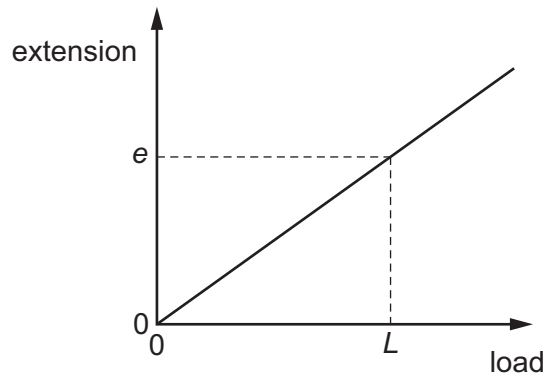
29 Which car, moving from rest, has an average acceleration of  $2.0 \text{ m/s}^2$ ?

- A a car reaching a speed of  $10 \text{ m/s}$  in  $2 \text{ s}$
- B a car reaching a speed of  $20 \text{ m/s}$  in  $5 \text{ s}$
- C a car reaching a speed of  $30 \text{ m/s}$  in  $10 \text{ s}$
- D a car reaching a speed of  $40 \text{ m/s}$  in  $20 \text{ s}$

30 What describes the density of a material?

- A the amount of matter in the material
- B the mass per unit volume of the material
- C the pull of gravity on the material
- D the volume per unit mass of the material

31 The diagram shows an extension-load graph for an elastic object.



A load of  $L$  produces an extension of  $e$ .

What happens when the load  $L$  is removed?

- A The extension  $e$  continues to increase.
- B The extension  $e$  reduces but does not return to zero.
- C The extension  $e$  remains.
- D The extension  $e$  returns to zero.

32 Four people run up the same steps.

Which person produces the largest power?

	weight of person / N	time taken / s
<b>A</b>	300	4
<b>B</b>	400	5
<b>C</b>	500	10
<b>D</b>	600	15

33 On a cold day, a girl notices that the metal case of her mobile phone feels colder to touch than the glass screen.

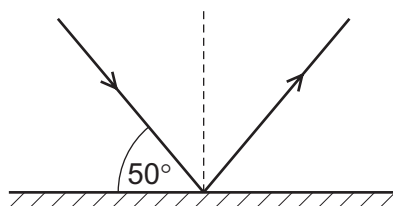
Which statement explains her observations?

- A Metal is a better conductor of heat than glass.
- B Metal is denser than glass.
- C Metal radiates heat less than glass.
- D The metal is thicker than the glass.

34 Which row correctly identifies examples of both a longitudinal and a transverse wave?

	longitudinal wave	transverse wave
<b>A</b>	light wave	radio wave
<b>B</b>	radio wave	sound wave
<b>C</b>	sound wave	surface water wave
<b>D</b>	surface water wave	light wave

35 The diagram shows a ray of light being reflected from a plane mirror.



The angle of incidence is increased by  $10^\circ$ .

What does the angle of reflection become?

- A**  $30^\circ$       **B**  $40^\circ$       **C**  $50^\circ$       **D**  $60^\circ$

36 Which row gives correct units for current and voltage?

	current	voltage
<b>A</b>	C/s	J/C
<b>B</b>	C/s	J/s
<b>C</b>	Cs	J/C
<b>D</b>	Cs	J/s

37 A 12V lamp uses a current of 2 A.

What is the resistance when the lamp is working correctly?

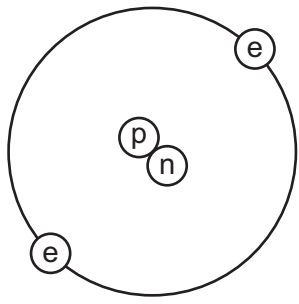
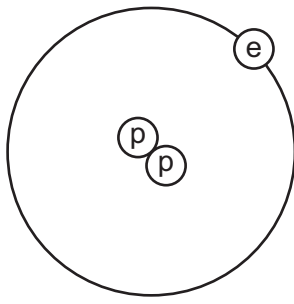
- A**  $6\ \Omega$       **B**  $10\ \Omega$       **C**  $14\ \Omega$       **D**  $24\ \Omega$

38 What is an example of induced magnetism?

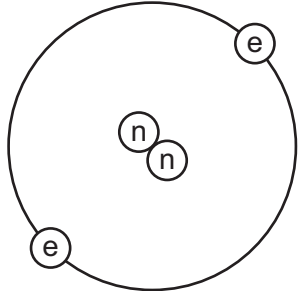
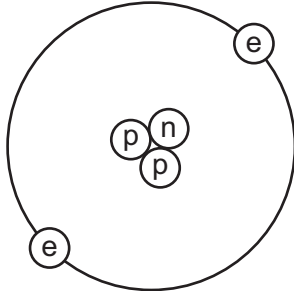
- A** a compass needle pointing north  
**B** a north pole attracting iron filings  
**C** a north pole repelling a north pole  
**D** a negatively charged balloon attracting small pieces of paper

39 Which diagram represents a neutral atom?

**A**                      **B**

**C**                      **D**

key  
 (e) electron  
 (n) neutron  
 (p) proton

40 When using a sealed radioactive source, what is **not** a necessary safety precaution?

- A** checking the level of background radiation
- B** handling the source with long tongs
- C** keeping the exposure to a minimum
- D** using as weak a source as possible



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## The Periodic Table of Elements

		Group																				
I	II	III	IV	V	VI	VII	VIII															
3 Li lithium 7	4 Be beryllium 9	11 Na sodium 23	12 Mg magnesium 24	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	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 Ac actinium —	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 —								
		<b>Key</b> atomic number atomic symbol name relative atomic mass		1 H hydrogen 1																		

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
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 —

actinoids

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