Cambridge
O Level

Cambridge International Examinations
Cambridge Ordinary Level

COMBINED SCIENCE **5129/22**

Paper 2 Theory **May/June 2017**

MARK SCHEME

Maximum Mark: 100

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

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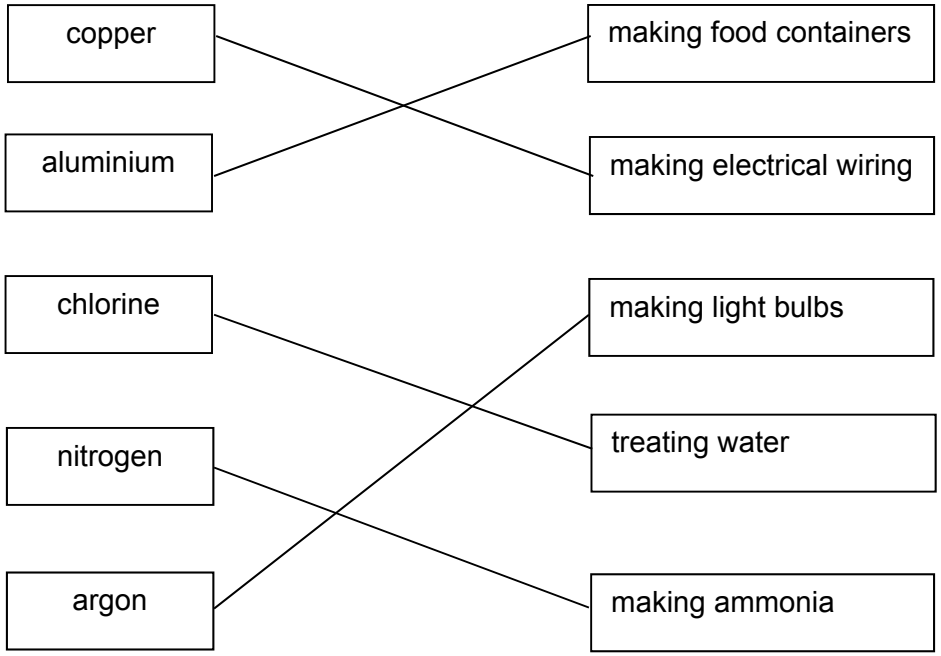
Question	Answer	Marks
1		**5**
	Total:	**5**

Question	Answer	Marks
2	plasma ; urea ; kidneys ; haemoglobin ; antibodies ;	**5**
	Total:	**5**

Question	Answer	Marks
3(a)	any **three** in sequence • slows down ; • stops ; • changes direction ; • speeds up / accelerates ; • non constant acceleration ;	**3**
3(b)	PE increases and KE decreases (until it stops / reaches top) ;	**1**
	Total:	**4**

Question	Answer	Marks
4(a)	80 ; 44 ; 2 ;	**3**
4(b)	any **two** from • low melting point / low boiling point ; • insoluble in water ; • does not conduct electricity when molten ; • does not conduct electricity in aqueous solution ;	**2**
4(c)	limewater ; goes milky ;	**2**
	Total:	**7**

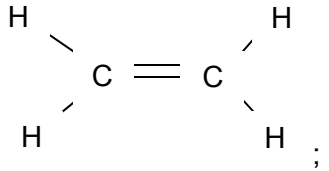
Question	Answer	Marks
5(a)	movement of <u>water</u> molecules ; through a <u>partially</u> permeable membrane ; from a region of higher concentration to a region of lower concentration ;	**3**
5(b)(i)	**A** = cell wall ; **B** = cytoplasm ; **C** = cell membrane ;	**3**
5(b)(ii)	line touching the nucleus ;	**1**
5(c)(i)	any **one** from • cell increased in size ; • vacuole is larger ; • cell wall is taut / description of ;	**1**
5(c)(ii)	any **three** from • water (molecules) pass through <u>cell wall by diffusion</u> ; • water passes by <u>osmosis through cell membrane</u> ; • <u>diffuses</u> through cytoplasm ; • passes by <u>osmosis into the vacuole</u> ;	**3**
	Total:	**11**

Question	Answer	Marks
6	2.4 ;	**3**
	Total:	**3**

Question	Answer	Marks
7(a)(i)	alkali metals ;	**1**
7(a)(ii)	decrease ;	**1**
7(b)(i)	20 ;	**1**
7(b)(ii)	shown as 2, 8, 8, 1 ;	**1**
7(c)(i)	K^+ O^{2-} ;	**1**
7(c)(ii)	11–14 ;	**1**
	Total:	**6**

Question	Answer	Marks
8(a)	the transfer of energy ;	**1**
8(b)	grass / acacia tree / trees ;	**1**
8(c)	(herbivores) = 4 ; (carnivores) = 3 ;	**2**
8(d)	decomposers / detritivores ;	**1**
	Total:	**5**

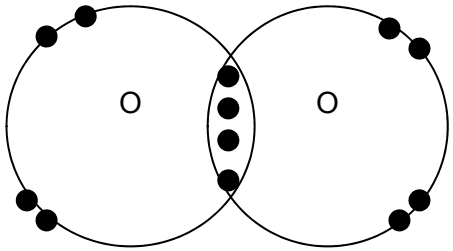
Question	Answer	Marks
9(a)(i)	normal lines for both rays ; reflected rays correct ; correct extension behind mirror ;	**3**
9(a)(ii)	same distance to right of mirror ;	**1**
9(b)(i)	radiation ;	**1**
9(b)(ii)	move the thermometer further away ; more air absorbs more of the radiation ;	**2**
9(b)(iii)	range is too small / not high enough ;	**1**
	Total:	**8**

Question	Answer	Marks
10(a)	98–100 ;	**1**
10(b)	C_nH_{2n+2} ;	**1**
10(c)	11 7 8 ;	**1**
10(d)(i)	cracking ;	**1**
10(d)(ii)	 ;	**1**
10(d)(iii)	it is flammable ;	**1**
	Total:	**6**

Question	Answer	Marks
11(a)(i)	male 1 ;	**1**
11(a)(ii)	female 2 ;	**1**
11(b)	volume of each breath increases ;	**1**
11(c)	any **two** from • more muscle contraction ; • more energy required ; • more oxygen needed ; • more respiration (of glucose) ; • more carbon dioxide to be excreted ;	**2**
	Total:	**5**

Question	Answer	Marks
12(a)	any **two** from • less dense ; • gas expands ; • less dense things move upwards / convection ;	**2**
12(b)	collecting plate has positive / opposite charge ; smoke particles attracted to the collecting plate ;	**2**
12(c)(i)	1.5 A ;	**1**

Question	Answer	Marks
12(c)(ii)	V=IR / 45 000 = 1.5 × R / 45 000 = ans (c)(i) × R ; 30 000 ; Ω ;	**3**
	Total:	**8**

Question	Answer	Marks
13(a)		**2**
13(b)(i)	20–21 ;	**1**
13(b)(ii)	exothermic ;	**1**
13(c)	acetylene ;	**1**
13(d)	zinc ;	**1**
	Total:	**6**

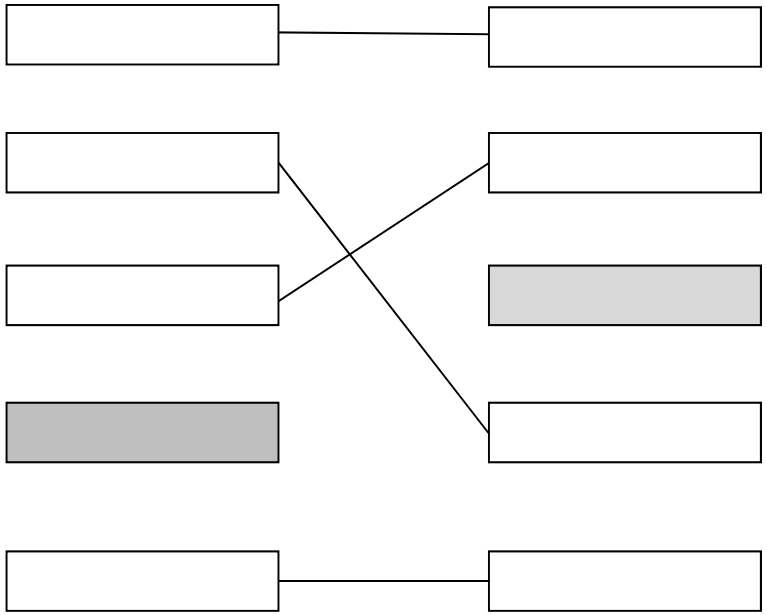
Question	Answer	Marks
14(a)	(upper mesophyll cells) receive more light ;	**1**
14(b)	any **one** from • to enable transpiration ; • to enable loss of water ; • to allow diffusion of water vapour / gases ; • to allow gaseous exchange ;	**1**
14(c)	any **one** from • lower surface is cooler (reducing water vapour loss) ; • not in direct sunlight ;	**1**
	Total:	**3**

Question	Answer	Marks
15(a)	d = m / v or 1055 / 1000 ; 1.055 ; g / cm^3 ;	**3**
15(b)	2.1 kW ;	**1**
	Total:	**4**

Question	Answer	Marks
16(a)(i)	**C** ;	**1**
16(a)(ii)	**B** ;	**1**
16(a)(iii)	**E** ;	**1**

Question	Answer	Marks
16(b)	it is impure ;	**1**
	Total:	**4**

Question	Answer	Marks
17(a)(i)	reduces risk of fire ;	**1**
17(a)(ii)	they have different thermal expansions (tick in bottom box) ;	**1**
17(b)(i)	prevent too much / high current ; reaching / damaging the appliance ;	**2**
17(b)(ii)	so appliance is not live / is isolated from live ;	**1**
17(c)	no part of surface casing can become live ;	**1**
	Total:	**6**

Question	Answer	Marks
18		**4**
	Total:	**4**