Cambridge International Examinations
Cambridge Ordinary Level

COMBINED SCIENCE **5129/21**

Paper 2 Theory **May/June 2017**

MARK SCHEME

Maximum Mark: 100

Published

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

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Question	Answer	Marks
1(a)	mass – amount of substance ; weight – effect of gravity on a mass ;	**2**
(b)(i)	rock one side of fulcrum, hammer other side equidistant on each side ;	**1**
(b)(ii)	F=ma **or** 1.25 = 0.75 × a **or** F / m=a **or** 1.25 / 0.75 (=a) ; 1.67 ; m / s^2 ;	**3**
	Total:	**6**

Question	Answer	Marks
2(a)(i)	28 ;	**1**
(a)(ii)	56 ; 1.4 ;	**2**
2(b)	incomplete combustion ; of carbon-containing substances / fuels ;	**2**
2(c)	3 2 3 ;	**1**
	Total:	**6**

Question	Answer	Marks
3(a)(i)	<table><tr><td>structure</td><td>arteries</td><td>veins</td></tr><tr><td>thickness of wall</td><td>thick</td><td>thin ;</td></tr><tr><td>size of lumen</td><td>small / narrow</td><td>large / wide ;</td></tr></table>	**2**
3(a)(ii)	<table><tr><td></td><td>arteries</td><td>veins</td></tr><tr><td>blood pressure</td><td>high / fluctuating</td><td>low / steady ;</td></tr><tr><td>direction of blood flow</td><td>away from the heart</td><td>towards the heart ;</td></tr></table>	**2**
3(b)	any **one** from • small diffusion distance / rapid diffusion ; • chemicals are easily exchanged (between blood and cells / tissue fluid) ;	**1**
3(c)(i)	to prevent backflow of blood (by closing) ;	**1**
3(c)(ii)	any **two** from blood pressure (in arteries) is high ; so blood will not flow backwards ;	**2**
	Total:	**8**

Question	Answer	Marks
4	any **three** from • electrons ; • electrons have negative charge ; • transfer / movement to the (girl's) hand ; • opposite charges attract ;	**3**
	Total:	**3**

Question	Answer	Marks
5(a)(i)	<u>halogens</u> ;	**1**
5(a)(ii)	increase ;	**1**
5(b)	a <u>molecule</u> containing two atoms ;	**1**
5(c)	iodine is less reactive ;	**1**
5(d)	<u>kills</u> bacteria ;	**1**
	Total:	**5**

Question	Answer	Marks
6(a)	arrow from tree going to finch ; 2 arrows from finch going to hawk and to eagle ;	**2**
6(b)(i)	the sun ;	**1**
6(b)(ii)	locust / aphid / finch ;	**1**
6(c)	finches would increase in number ; because they are not eaten by the eagles ; **OR** finches would decrease in number ; because there would be more hawks (as not eaten by eagles) so they would eat more finches ;	**2**
	Total:	**6**

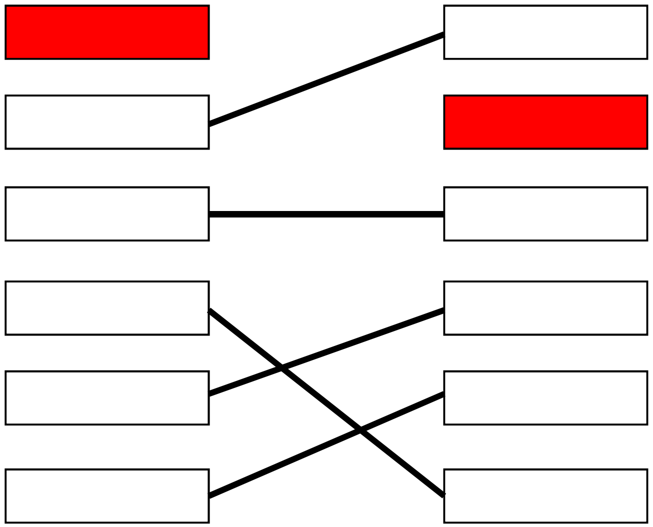
Question	Answer	Marks
7	1.3(3…3) ;	**3**
	Total:	**3**

Question	Answer	Marks
8(a)	64 ; 49 49 ;	**2**
8(b)	indium ;	**1**
8(c)	in same group as aluminium ; has 3 electrons in outer shell ;	**2**
	Total:	**5**

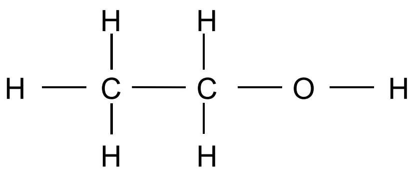
Question	Answer	Marks
9	<u>anther</u> ; carpel / stigma ; <u>cotyledon</u> ; <u>radical</u> ; <u>shoot</u> ;	**5**
	Total:	**5**

Question	Answer	Marks
10(a)	energy outputs = 100% ; energy output = energy input ;	**2**
10(b)	chemical to heat (during burning) ; heat to kinetic (in the turbines) ; kinetic to electrical ;	**3**
	Total:	**5**

Question	Answer	Marks
11(a)(i)	hydrogen ;	**1**
11(a)(ii)	1–3 ; orange ;	**2**
11(b)(i)	any **two** from • zinc hydroxide ; • zinc carbonate ; • zinc oxide ;	**2**
11(b)(ii)	(too) low in the reactivity series ;	**1**
	Total:	**6**

Question	Answer	Marks
12(a)		**5**
12(b)(i)	villi are responsible for absorption ; (**Q**) has more villi (per cm^2) than the other three students ;	**2**
12(b)(ii)	any **one** from • absorbed substances are removed by the blood ; • concentration gradient maintained ;	**1**
	Total:	**8**

Question	Answer	Marks
13(a)(i)	V = IR ; 12 = 0.08 × R **or** R = 12 / 0.08 ; 150 ;	**3**
13(a)(ii)	E=ItV **or** 0.08 × 30 × 12 ; 28.8 ;	**2**
13(b)(i)	(0.48 + 0.16 + 0.24 =) 0.88 ;	**1**
13(b)(ii)	any **one** from it is a parallel circuit ; different resistance (in parallel) ; bigger voltage across each component ;	**1**
	Total:	**7**

Question	Answer	Marks
14(a)	**A** = steam ; **B** = polymerisation ;	**2**
14(b)	addition / gain of hydrogen ;	**1**
14(c)	bromine ;	**1**
14(d)(i)	 ;	**1**

Question	Answer	Marks
14(d)(ii)	any **one** from • solvent ; • fuel ; • antiseptic wipes ;	**1**
	Total:	**6**

Question	Answer	Marks
15(a)	**A** = sperm duct ; **B** = <u>penis</u> ; **C** = <u>urethra</u> ; **D** = testis ;	**4**
15(b)	*prostate gland:* produces liquid (for sperm to swim in) / mucus / alkaline liquid ; *scrotum:* protects testis / keeps testes cool ;	**2**
15(c)	accept cross on sperm duct in any position ;	**1**
	Total:	**7**

Question	Answer	Marks
16(a)	one-quarter wavelength correctly labelled anywhere on Fig. 6.2 ;	**1**
16(b)(i)	1.2 (m) ;	**1**
16(b)(ii)	v= f λ **or** 330 = f $\times$ 1.2 ; f = 275 ;	**2**
	Total:	**4**

Question	Answer	Marks
17(a)	potassium nitrate ;	**1**
17(b)	calcium carbonate ;	**1**
17(c)	oxygen ;	**1**
17(d)	nitrogen dioxide ;	**1**
17(e)	nitrogen ;	**1**
	Total:	**5**

Question	Answer	Marks
18(a)	any **three** from • alternating current ; • (causes) changing magnetic field (in primary) ; • core connects magnetic field to secondary coil ; • magnetic field cuts/induces e.m.f. in secondary coil ;	**3**
18(b)	V = IR **or** V = 100 × (1 / 1 000) ; 0.1 ;	**2**
	Total:	**5**