



Cambridge International Examinations
Cambridge Ordinary Level

COMBINED SCIENCE

5129/21

Paper 2 Theory

October/November 2016

MARK SCHEME

Maximum Mark: 100

Published

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Question	Answer	Marks
1(a)(i)	$0.043 \times 10 = 0.43$	1
1(a)(ii)	$0.43 \times 0.5 = 0.215$	1
1(b)	any one from - work is done against friction / air resistance - transferred as heat (to the surroundings) - transferred as sound	1

Question	Answer	Mark
2(a)(i)	A = palisade / mesophyll cell B = chloroplast C = nucleus D = cuticle	4
2(a)(ii)	any one from - to waterproof the leaf - prevent loss of water from the leaf - reduce evaporation	1

Question	Answer	Mark
3(a)(i)	80	1
3(a)(ii)	$\begin{array}{r} 32 \quad 160 \\ 4 \end{array}$	3
3(b)	$\text{SO}_3 + \text{H}_2\text{O} \longrightarrow \text{H}_2\text{SO}_4$	1

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Question	Answer	Mark
3(c)	any one from • copper carbonate • copper hydroxide • copper oxide	1
3(d)	fossil fuels contain sulphur compounds (which burn)	1

Question	Answer	Mark
4(a)	1.46 cm	1
4(b)	start timer as it passes X stop timer as it passes Y	2

Question	Answer	Mark
5(a)	any two from • urea • bile • glycogen	2
5(b)	any two from • amino acids • alcohol • hormones; • drugs / toxic chemicals	2

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Question	Answer	Mark
6(a)	carbon monoxide	1
6(b)	nitrogen	1
6(c)	ammonia	1
6(d)	hydrogen	1
6(e)	argon	1

Question	Answer	Mark
7(a)	any one from • higher temperature • lower density	1
7(b)(i)	any one from • good conductor of heat • resistant to corrosion / does not react with water	1
7(b)(ii)	good absorber of heat	1
7(c)	any one from • hot water lower density • heated water rises • by convection	2

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Question	Answer	Mark
8	both rays correct refraction inside the lens both rays correct refraction leaving the lens	2

Question	Answer	Mark
9(a)(i)	farm worker	1
9(a)(ii)	10 000	1
9(b)	any two from - energy intake is more than energy used / 3750 kJ more than is required - excess food converted to fat - fat stored in body increasing weight	2
9(c)	any two from - age - gender / sex - occupation	2

Question	Answer	Mark
10(a)	8 2,5 17 40	4
10(b)	S and V	1
10(c)(i)	TU ₂	1
10(c)(ii)	ionic	1

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Question	Answer	Mark
11(a)(i)	visible light	1
11(a)(ii)	$3 \times 10^8 \text{ m/s}$	1
11(b)	frequency	1
11(c)	water wave	1

Question	Answer	Mark
12	<u>glands</u> <u>plasma</u> <u>target</u>	3

Question	Answer	Mark
13(a)(i)	produces energy	1
13(a)(ii)	carbon dioxide water	2
13(b)	<u>same general formula</u> any one from • gradation in physical properties • same chemical properties • formula differs by CH_2 • same functional group	1 1

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Question	Answer	Mark
13(c)	$ \begin{array}{c} \text{H} \\ \\ \text{H} - \text{C} - \text{H} \\ \\ \text{H} \end{array} $	1

Question	Answer	Mark
14(a)	the voltage increases then returns to <u>zero</u>	2
14(b)	any one from • strength of magnet • speed of movement	1
14(c)	$V = I R$ or $I = V/R$ or $I = 0.0003/9$ 3.33×10^{-5} A/Amps	3

Question	Answer	Mark
15(a)	light	1
15(b)	<u>grass</u> 2 4	3

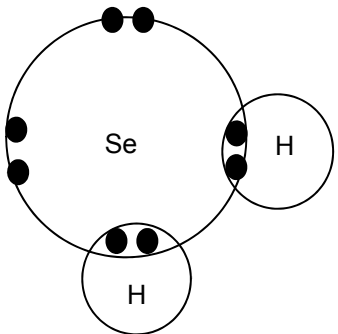
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Question	Answer	Mark
16(a)	Y X Z W	2
16(b)(i)	removal of oxygen	1
16(b)(ii)	hydrogen more reactive (than W)	1
16(c)	any one from • conduct electricity • malleable • high melting point • shiny	1

Question	Answer	Mark
17(a)(i)	neutral	1
17(a)(ii)	any one from • if appliance casing becomes live • current exceeds fuse rating / current is too high it melts	1 1
17(b)	casing cannot become live	1
17(c)	7A chance of damage to appliance is small up to this amount	2

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Question	Answer	Mark
18	E E D	3

Question	Answer	Mark
19(a)		2
19(b)(i)	hydrogen	1
19(b)(ii)	pH = 3 – 5	1

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Question	Answer	Mark
20(a)	Lead	1
	gamma radiation cannot penetrate	1
20(b)(i)	20 000	1
20(b)(ii)	5.25 years	1