



COMBINED SCIENCE

5129/22

Paper 2 Theory

May/June 2017

MARK SCHEME

Maximum Mark: 100

Published

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This document consists of **11** printed pages.

Question	Answer	Marks
1		5
Total:		5

Question	Answer	Marks
2	<u>plasma</u> ; <u>urea</u> ; <u>kidneys</u> ; <u>haemoglobin</u> ; <u>antibodies</u> ;	5
Total:		5

Question	Answer	Marks
3(a)	any three in sequence <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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

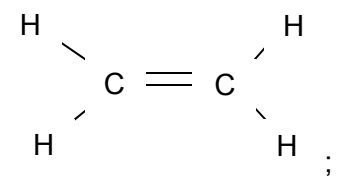
Question	Answer	Marks
5(a)	movement of <u>water</u> molecules ; through a <u>partially</u> permeable membrane ; from a region of higher concentration to a region of lower concentration ;	3
5(b)(i)	A = cell wall ; B = cytoplasm ; C = cell membrane ;	3
5(b)(ii)	line touching the nucleus ;	1
5(c)(i)	any one from <ul style="list-style-type: none"> • cell increased in size ; • vacuole is larger ; • cell wall is taut / description of ; 	1
5(c)(ii)	any three from <ul style="list-style-type: none"> • 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)	<u>alkali metals</u> ;	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

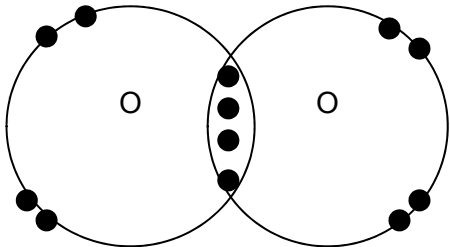
Question	Answer	Marks
9(a)(i)	normal lines for both rays ; reflected rays correct ; correct extension behind mirror ;	3
9(a)(ii)	same distance to right of mirror ;	1
9(b)(i)	radiation ;	1
9(b)(ii)	move the thermometer further away ; more air absorbs more of the radiation ;	2
9(b)(iii)	range is too small / 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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)	$V=IR$ / $45\,000 = 1.5 \times R / 45\,000 = \text{ans (c)(i)} \times R$; 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 <ul style="list-style-type: none"> • 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 <ul style="list-style-type: none"> • 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