



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE

0653/63

Paper 6 Alternative to Practical

October/November 2016

MARK SCHEME

Maximum Mark: 60

Published

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This document consists of **7** printed pages.

Page 2	Mark Scheme	Syllabus	Paper
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Question	Answers	Marks												
1(a)	<table> <tr> <td>Nutrient tested for</td><td>Testing solution</td><td>Heat needed? (Yes/no)</td></tr> <tr> <td>Protein</td><td>Biuret</td><td>no</td></tr> <tr> <td>Reducing sugar</td><td>Benedict's</td><td>yes</td></tr> <tr> <td>Starch</td><td>Iodine</td><td>no</td></tr> </table> 3 correct reagents = 2, 1 correct = 1;; 1 mark for heat for reducing sugar only ;	Nutrient tested for	Testing solution	Heat needed? (Yes/no)	Protein	Biuret	no	Reducing sugar	Benedict's	yes	Starch	Iodine	no	3
Nutrient tested for	Testing solution	Heat needed? (Yes/no)												
Protein	Biuret	no												
Reducing sugar	Benedict's	yes												
Starch	Iodine	no												
1(b)	<table> <tr> <td>Testing solution used</td><td>Initial colour</td><td>Colour after test</td></tr> <tr> <td>Benedict's solution</td><td>Blue</td><td>blue</td></tr> <tr> <td>biuret solution</td><td>Blue</td><td>purple/lilac</td></tr> <tr> <td>iodine</td><td>brown</td><td>brown</td></tr> </table> purple / lilac for protein ; negative colours brown and blue ;	Testing solution used	Initial colour	Colour after test	Benedict's solution	Blue	blue	biuret solution	Blue	purple/lilac	iodine	brown	brown	2
Testing solution used	Initial colour	Colour after test												
Benedict's solution	Blue	blue												
biuret solution	Blue	purple/lilac												
iodine	brown	brown												
1(c)	Benedict's: yellow / green / orange / red ; iodine: blue-black ;	2												
1(d)	same volume of juice and lemonade ; same volume of Benedict's solution ; yellow / green for small amount of reducing sugar OR orange / red for high(er) amount of reducing sugar ;	3												
	Total:	10												

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Question	Answers	Marks
2(a)	30 ; 32 ;	2
2(b)(i)	31 ;	1
2(b)(ii)	0.032 0.019/0.018, 0.012/0.011 ;	1
2(c)(i)	linear scale for vertical axis using at least half of the grid ; all three points plotted correctly to within half a small square ; best appropriate straight line or curve <u>through the origin</u> ;	3
2(c)(ii)	as concentration increases speed increases ;	1
2(d)	0.75 and difference between them is much greater than difference between other pairs / % difference greater than other pairs / % difference greater than 10% ;	1
2(e)	(reacted chips have) smaller surface area / (already reacted chips will) react slower ;	1
	Total:	10

Page 4	Mark Scheme	Syllabus	Paper
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Question	Answers	Marks
3(a)(i)	correct symbol for voltmeter ; correct parallel (voltmeter) connection between X and Y ;	2
3(a)(ii)	1.9 (V) ;	1
3(a)(iii)	0.24 (A) ;	1
3(a)(iv)	7.9 ; Unit Ω / ohm ;	2
3(b)	15 (Ω) ;	1
3(c)	YES (no mark) and values of R_T and $0.5 R_S$ are close enough / difference can be attributed to experimental error ;	1
3(d)	resistors become hot / temperature affects resistance ;	1
3(e)	increases ;	1
	Total:	10

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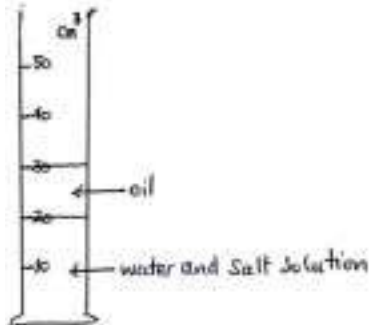
Question	Answers				Marks
4(a)	Test-tube	Initial colour	Final Colour	Change in CO2 concentration (increase / decrease / no change)	1
	A	red	purple	decrease	
	B	red	yellow	increase	
	C	red	red	(no change)	
	D	red	red	no change	
changes for A <u>and</u> B correct ; anything other than no change for D = no marks					
4(b)(i)	photosynthesis (removes CO ₂) ;				1
4(b)(ii)	respiration (produces CO ₂) ;				1
4(b)(iii)	rate of photosynthesis and respiration is matched ;				1
4(c)	control / to show no change without organisms ;				1
4(d)(i)	water bath ; between 10–40 °C ;				2
4(d)(ii)	volume of water ; number / size of tadpoles ; size of pondweed ; amount of indicator ; light intensity ; type of water ; type of pondweed ;				max 3
	Total:				10

Page 6	Mark Scheme	Syllabus	Paper
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Question	Answers	Marks
5(a)(i)	symbol for cell / DC power supply ; symbol for ammeter or lamp ;	2
5(a)(ii)	copper oxide / CuO ;	1
5(b)(i)	thermometer and stopper ; thermometer bulb opposite to the side-arm ;	2
5(b)(ii)	99.5 (°C) ;	1
5(b)(iii)	(0.5 less than 100) within experimental error / inaccuracy of thermometer / height above sea level ;	1
5(c)	carbon dioxide / CO ₂ ;	1
5(d)	sodium hydroxide solution / add ammonia solution ; colour of ppt. / specific example, e.g. blue ppt. = Cu ²⁺ ;	2
	Total:	10

Question	Answers	Marks
6(a)(i)	29. <u>0</u> ; 41. <u>0</u> ;	2
6(a)(ii)	eye level / bottom of meniscus ;	1
6(b)	1.2 (1.193103448275862) ; 0.8 (0.8390243902439024463) ;	2
6(c)(i)	(teat / dropping) pipette ;	1
6(c)(ii)	formula takes it into account ;	1

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Question	Answers	Marks
6(c)(iii)	find the average / mean (of the three results for each liquid) ;	1
6(d)(i)	S and because it is less dense than water / liquid T ;	1
6(d)(ii)	oil / S on top (ecf) with one line at 20 ;  (water and salt solution or water and solution R)	1
	Total:	10