



**Cambridge Assessment International Education**  
Cambridge International General Certificate of Secondary Education

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**COMBINED SCIENCE**

**0653/63**

Paper 6 Alternative to Practical

**October/November 2017**

MARK SCHEME

Maximum Mark: 60

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**Published**

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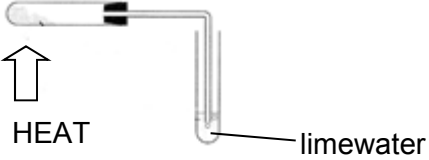
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This document consists of **7** printed pages.



Question	Answer	Marks
1(a)(i)	Axes correctly labelled: surface area <b>and</b> cm <sup>2</sup> <b>and</b> distance / d <b>and</b> cm ; Suitable linear scale using at least half the grid ; All 4 points plotted correctly $\pm$ half small square ; Best fit straight line through origin ;	<b>4</b>
1(a)(ii)	More enzyme, faster reaction ORA ;	<b>1</b>
1(a)(iii)	Correct reading from graph ; Lines on graph to show working ;	<b>2</b>
1(b)	Any <b>two</b> from temperature ; pH ; pieces from same potato ; concentration of peroxide ;	<b>2</b>
1(c)	Glowing splint <b>and</b> relights ;	<b>1</b>

Question	Answer	Marks						
2(a)(i)	 <p>apparatus ; <b>H</b> or limewater label and 'HEAT' ;</p>	2						
2(a)(ii)	to prevent suckback / to stop cold liquid hitting hot solid / to prevent glassware cracking ;	1						
2(a)(iii)	carbon dioxide (gas) ;	1						
2(a)(iv)	<b>H</b> is a carbonate ;	1						
2(a)(v)	zinc carbonate / $\text{ZnCO}_3$ ;	1						
2(b)(i)	white ;	1						
2(b)(ii)	(white) ppt ;	1						
2(c)(i)	<table border="1" data-bbox="353 944 1167 1098"> <thead> <tr> <th>(test / reagent)</th> <th>(observation)</th> </tr> </thead> <tbody> <tr> <td>barium nitrate solution</td> <td>no reaction</td> </tr> <tr> <td>silver nitrate solution</td> <td>yellow ppt.</td> </tr> </tbody> </table> <p>;</p>	(test / reagent)	(observation)	barium nitrate solution	no reaction	silver nitrate solution	yellow ppt.	1
(test / reagent)	(observation)							
barium nitrate solution	no reaction							
silver nitrate solution	yellow ppt.							
2(c)(ii)	iodide / $\text{I}^-$ / not sulfate / not $\text{SO}_4^{2-}$ / not chloride / not $\text{Cl}^-$ / not bromide / not $\text{Br}^-$ ;	1						

Question	Answer	Marks
3(a)(i)	59.8 (cm) ;	1
3(a)(ii)	29.8 (cm) ;	1
3(a)(iii)	1.0 and 1.7 ;	1
3(a)(iv)	2.0 and 2.7 ;	1
3(b)(i)	plots correct to half a small square, at least 4 correct ; good best fit line judgement ;	2
3(b)(ii)	indication <u>on graph</u> of how data obtained AND at least half of line used ; correct calculation for triangle method using data from graph ;	2
3(b)(iii)	$(15.0 \pm 1.0) \frac{2}{3}$ s.f. only ;	1
3(c)	any <b>one</b> from move screen slowly to / fro until sharpest focus obtained ; object / lens / screen perpendicular to bench ; object and lens same height above the bench ; carry out experiment away from other bright light sources / darkened room ;	1

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
4(a)	(Placed in a suitable dish with) water ; (Kept in a) warm (place) / suitable temperature ;	<b>2</b>
4(b)	shorter shoot in <b>A</b> ; taller shoot in <b>C</b> ;	<b>2</b>
4(c)	Heat ; Benedicts solution ; Yellow / green / orange / red ;	<b>3</b>
4(d)	Lighting from one side ; Control – even light / in the dark ; More than one seedling (in each condition) ;	<b>3</b>

Question	Answer	Marks
5(a)(i)	alkali / hydroxide ion / OH <sup>-</sup> ;	1
5(a)(ii)	green <b>and</b> ppt. ;	1
5(a)(iii)	aqueous Fe <sup>3+</sup> / dissolve / react with acid ; add (excess) sodium hydroxide solution / ammonia solution ; red-brown and ppt. ;	3
5(b)(i)	oil on top label ; boiled water label ;	2
5(b)(ii)	all nails made of iron / steel ;	1
5(c)	need to show that water alone does not cause rusting as in <b>L</b> ; need to show that air alone does not cause rusting as in <b>J</b> ;	2

Question	Answer	Marks
6(a)(i)	4.2 ; 13.0 ;	<b>2</b>
6(a)(ii)	1,4,6,8 ; all use brick / same block ; all have different surfaces / all surfaces ;	<b>3</b>
6(a)(iii)	sand carpet wood glass ;	<b>1</b>
6(b)	difficult to judge the first pull / accuracy / minimise errors / lessens effects of anomalies AVP ;	<b>1</b>
6(c)	would be difficult to stop / slip / slide etc. ;	<b>1</b>
6(d)	sand / gravel / very rough tarmac ; high resistance to movement / would slow / stop car quickest / big(gest) resisting force / large(st) friction ;	<b>2</b>