



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

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**COMBINED SCIENCE**

**0653/63**

Paper 6 Alternative to Practical

**May/June 2017**

MARK SCHEME

Maximum Mark: 60

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**Published**

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<b>Question</b>	<b>Answer</b>	<b>Marks</b>
1(a)	11.1 (cm <sup>3</sup> ); 15.8 (cm <sup>3</sup> );	<b>2</b>
1(b)	axes labelled with units ; suitable linear scale using at least half the grid ; at least 4 points plotted $\pm$ half small square ; best-fit curve through origin ;	<b>4</b>
1(c)(i)	carbon dioxide ;	<b>1</b>
1(c)(ii)	respiration ;	<b>1</b>
1(d)(i)	line below original line ;	<b>1</b>
1(d)(ii)	volume of yeast / temperature ;	<b>1</b>

Question	Answer	Marks
2(a)(i)	completed apparatus with gas tight bung in one test-tube and delivery tube into other test-tube ; correct labels for delivery tube <b>AND</b> one chemical i.e. <b>H</b> or limewater ;	<b>2</b>
2(a)(ii)	to avoid suck back / to prevent cold limewater hitting hot solid ;	<b>1</b>
2(a)(iii)	<b>H</b> is a carbonate ;	<b>1</b>
2(b)	<b>H</b> is copper carbonate ; <b>J</b> is copper sulfate ;  <b>OR</b>  two copper compounds ; a carbonate and a sulfate ;	<b>max 2</b>
2(c)	<b>K</b> is copper oxide / CuO ;	<b>1</b>
2(d)	add barium nitrate <b>AND</b> white ppt. ;	<b>1</b>
2(e)(i)	white ppt. / colourless solution / white ppt. which disappears ;	<b>1</b>
2(e)(ii)	any ppt. has dissolved / no ppt. in excess ;	<b>1</b>

Question	Answer	Marks
3(a)(i)	7.5 (cm) ;	1
3(a)(ii)	37.5 (cm) ;	1
3(a)(iii)	40.0 and 26.7 ;	1
3(b)	<i>any 1 for 1 mark:</i> move screen slowly to and 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 ;	max 1
3(c)(i)	suitable choice of scale ( $\geq$ half the grid used) for x-axis ; plots correct to half a small square, at least 4 correct ; good best-fit straight line judgement ;	3
3(c)(ii)	intercept correct from candidate's graph ;	1
3(c)(iii)	correct calculation for $f$ ; 15.0 ( $\pm$ 1.0) cm ;	2

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
4(a)	water ; oxygen ; suitable temperature ;	<b>max 2</b>
4(b)	light from above / all sides equally ;	<b>1</b>
4(c)	shoot drawn in all three dishes ; shortest shoot in <b>A</b> ; tallest shoot in <b>C</b> ;	<b>3</b>
4(d)	Benedict's solution ; heat ; yellow / green / orange / red ;	<b>3</b>
4(e)	not all grow / some die ; identify anomalies ; improve reliability ;	<b>max 1</b>

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
5(a)	mention of time <b>AND</b> volume ; link between volume and time ;	<b>2</b>
5(b)(i)	<i>observations:</i> bubbles faster ;  <i>measurement:</i> more gas in the same time <b>OR</b> less time for the same amount of gas ;	<b>2</b>
5(b)(ii)	repeats ; at least one more increased surface area ; 3 lots more ;	<b>max 2</b>
5(b)(iii)	temperature ; state of Mg ; concentration of acid ;	<b>max 2</b>
5(c)	hydrogen ; lighted splint <b>AND</b> pops ;	<b>2</b>

Question	Answer	Marks
6(a)	40.4 (cm) ;	<b>1</b>
6(b)(i)	point plotted within 1 / 2 small square and curve ; curve ignores anomalous point ;	<b>2</b>
6(b)(ii)	as $\theta$ increases distance increases ; increase getting less ;	<b>2</b>
6(c)	$\theta$ constant ; at least 4 diameters ; same material for ball bearings ; range OK e.g. 1,2,3,4, etc. ;	<b>max 3</b>
6(d)(i)	kinetic / movement <b>AND</b> kinetic / movement ;	<b>1</b>
6(d)(ii)	would go too far / friction of cloth greater / friction of bench too small ;	<b>1</b>