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Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/63**

Paper 6 Alternative to Practical **May/June 2017**

MARK SCHEME

Maximum Mark: 60

Published

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

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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 **AND** one chemical i.e. **H** or limewater ;	**2**
2(a)(ii)	to avoid suck back / to prevent cold limewater hitting hot solid ;	**1**
2(a)(iii)	**H** is a carbonate ;	**1**
2(b)	**H** is copper carbonate ; **J** is copper sulfate ; **OR** two copper compounds ; a carbonate and a sulfate ;	**max 2**
2(c)	**K** is copper oxide / CuO ;	**1**
2(d)	add barium nitrate **AND** white ppt. ;	**1**
2(e)(i)	white ppt. / colourless solution / white ppt. which disappears ;	**1**
2(e)(ii)	any ppt. has dissolved / no ppt. in excess ;	**1**

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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)	*any 1 for 1 mark:* 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 ($\geqslant$ 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**

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

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

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

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