Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CO-ORDINATED SCIENCES **0654/63**

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

MARK SCHEME

Maximum Mark: 60

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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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**

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**

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**

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**

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**

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**