



CO-ORDINATED SCIENCES

0654/63

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 \pm 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)	<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

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)	<i>observations:</i> bubbles faster ; <i>measurement:</i> 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