



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE

0653/51

Paper 5 Practical Test

May/June 2017

MARK SCHEME

Maximum Mark: 30

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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This document consists of **4** printed pages.

Question	Answer				Marks																
1(a)	Benedict's test ;				1																
1(b)		<table><tr><td></td><td>Benedict's test</td><td>biuret test</td><td>iodine test</td></tr><tr><td>banana</td><td>yellow / green / orange / red</td><td>blue / no change</td><td>blue-black</td></tr><tr><td>chick peas</td><td>blue / no change</td><td>purple</td><td>blue-black</td></tr><tr><td>egg white</td><td>blue / no change</td><td>purple</td><td>brown / no change</td></tr></table>		Benedict's test	biuret test	iodine test	banana	yellow / green / orange / red	blue / no change	blue-black	chick peas	blue / no change	purple	blue-black	egg white	blue / no change	purple	brown / no change			3
	Benedict's test	biuret test	iodine test																		
banana	yellow / green / orange / red	blue / no change	blue-black																		
chick peas	blue / no change	purple	blue-black																		
egg white	blue / no change	purple	brown / no change																		
	one mark per column ;																				
1(c)(i)	(reducing sugar) and starch ;				1																
1(c)(ii)	protein and starch ;				1																
1(c)(iii)	protein ;				1																
1(d)	(dissolve in) ethanol; (add) water; cloudy / emulsion / milky ;				3																

Question	Answer			Marks									
2(a)(i)		<table><tr><td></td><td>solution H</td><td>solution J</td></tr><tr><td>red litmus paper</td><td>red / no change and</td><td>blue and</td></tr><tr><td>blue litmus paper</td><td>blue / no change ;</td><td>blue / no change ;</td></tr></table>		solution H	solution J	red litmus paper	red / no change and	blue and	blue litmus paper	blue / no change ;	blue / no change ;		2
	solution H	solution J											
red litmus paper	red / no change and	blue and											
blue litmus paper	blue / no change ;	blue / no change ;											
2(a)(ii)	(solution H could be) barium nitrate (or) silver nitrate ; (both needed for mark) (solution J could be) ammonia (or) sodium hydroxide ; (both needed for mark)			2									
2(b)(i)		<table><tr><td></td><td>solution H</td><td>solution J</td></tr><tr><td>observations on slowly adding copper sulfate solution</td><td>(white) ppt. / cloudy / milky / turns white and...</td><td>dark blue (solution) / blue ppt. ;</td></tr><tr><td>colour of any residue</td><td>...white ;</td><td>blue / light blue ;</td></tr></table>		solution H	solution J	observations on slowly adding copper sulfate solution	(white) ppt. / cloudy / milky / turns white and...	dark blue (solution) / blue ppt. ;	colour of any residue	...white ;	blue / light blue ;		3
	solution H	solution J											
observations on slowly adding copper sulfate solution	(white) ppt. / cloudy / milky / turns white and...	dark blue (solution) / blue ppt. ;											
colour of any residue	...white ;	blue / light blue ;											
2(b)(ii)	H is barium nitrate (solution) ; J is ammonia (solution) ;			2									
2(c)	(iron(III) sulfate) gives brown ppt. with both sodium hydroxide and ammonia / observations the same with both sodium hydroxide and ammonia ;			1									

Question	Answer	Marks
3(a)(i)	I and V values recorded ;	1
3(a)(ii)	all recorded I values < 0.5 A and to at least 2 d.p. ; all recorded V values < 2.5 V and to at least 1 d.p. ; V values increasing ;	3
3(a)(iii)	R values recorded to consistent 2 / 3 significant figures ;	1
3(b)	suitable choice of scales ($\geq$ half the grid used) ; 5 plots correct to half a small square ; good best-fit line judgement ;	3
3(c)(i)	value of R correctly read from graph ;	1
3(c)(ii)	(directly) proportional / as length increases so resistance increases ;	1



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Question	Answer	Marks
1(a)	quality drawing in pencil using at least half the space ; male parts, anther and filament drawn ; female parts, stigma and ovary drawn ; petals drawn ;	4
1(b)(i)	line drawn edge to edge ; correct measurement of drawing and sensible flower measurement ;	2
1(b)(ii)	correct calculation ;	1
1(c)	benedict's solution; heat; orange / red indicates more sugar or yellow / green indicates less sugar ;	3

Question	Answer	Marks
2(a)(i)	temperature recorded and within 5 °C of supervisor's value ; both volumes recorded and $V_2 > V_1$;	2
2(a)(ii)	temperature recorded for experiment 2 and 8–12 °C above the temperature for experiment 1 ; both volumes recorded and both greater than those in (a)(i) ;	2
2(a)(iii)	temperatures for experiment 3 recorded and to nearest half degree ; V_1 and V_2 for experiment 3 greater than V_1 and V_2 for experiment 2 ;	2
2(b)(i)	all values of V correct ;	1
2(b)(ii)	the higher the temperature the higher the rate of the reaction ;	1

Question	Answer	Marks
2(c)	bubble into water ; count bubbles in a certain time / time for certain number of bubbles ; or connect delivery tube to a gas syringe ; measure volume in a certain time / time for a certain volume ; or place reaction flask on a balance ; measure mass (decrease) in a certain time / time for certain drop in mass ;	2

Question	Answer	Marks
3(a)(i)	m present and to 0.1 g ;	1
3(a)(ii)	V_1 present and $65 \pm 5 \text{ (cm}^3\text{)}$;	1
3(a)(iii)	V_2 present ; $V_2 > V_1$;	2
3(a)(iv)	calculation correct ;	1
3(a)(v)	calculation correct and 2 / 3 sig fig ; g / cm^3 ;	2
3(b)(i)	any 2 from ; not reading to bottom of meniscus not reading perpendicular to scale of measuring cylinder / not eye level test tube touching the side of cylinder / how the test-tube floats zero error on balance	max 2
3(b)(ii)	state effect on V or m and hence effect on d_2 ;	1