Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/62**

Paper 6 Alternative to Practical **May/June 2018**

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)(i)	quality drawing and at least half the box ; some detail in the centre ;	**2**
1(a)(ii)	41 ± 1 ; line **and** measured to nearest mm ± 3 ;	**2**
1(a)(iii)	correct calculation of magnification ;	**1**
1(b)	no protein ;	**1**
1(c)(i)	heat (with benedict's solution) ; reducing sugar present ; yellow / green / orange / red ;	**3**
1(c)(ii)	goggles because of hot water / chemicals in eye ; **OR** use of hot water bath so hot liquid not ejected ;	**1**

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>2(a)(i)</td><td>ammonia solution / sodium hydroxide solution ;

(pale) blue ppt. ;</td><td>2</td></tr>
<tr><td>2(a)(ii)</td><td>
<table>
<tr><th>test</th><th>observation with HCl</th><th>observation with H_2SO_4</th></tr>
<tr><td>silver nitrate
AND
⇩</td><td>white ppt.
AND ⇨</td><td>…no reaction / slight white ppt. ;</td></tr>
<tr><td>… barium nitrate / barium chloride / Ba^{2+} ;</td><td>no reaction
AND ⇨</td><td>…white ppt. ;</td></tr>
</table>
</td><td>3</td></tr>
<tr><td>2(b)</td><td>filter funnel, paper and collection vessel ;

filtrate and residue correctly labelled ;</td><td>2</td></tr>
<tr><td>2(c)(i)</td><td>exothermic / (metal) displacement ;</td><td>1</td></tr>
<tr><td>2(c)(ii)</td><td>copper (metal) / Cu ;</td><td>1</td></tr>
<tr><td>2(d)</td><td>so test-tube will not crack / break ;</td><td>1</td></tr>
</table>

Question	Answer	Marks
3(a)(i)	87.8 (cm) ;	**1**
3(a)(ii)	take reading each side and find average / mark the centre point on the block (edge) ;	**1**
3(b)	*a* = 30(.0) **AND** *b* = 47.8 ;	**1**
3(c)(i)	axes labelled with units ; suitable choice of scales (⩾ half the grid used for points) ; 4 plots correct to half a small square ;	**3**
3(c)(ii)	good best fit line judgement ;	**1**
3(c)(iii)	6.0 ± 1 ;	**1**
3(d)	120 ;	**1**
3(e)	any **one** from: difficulty in obtaining balance ; load **L** not uniform ; difficulty in placing the centre of **L** over the mark on the rule ;	**1**

Question	Answer	Marks
4(a)	in the dark ; for a few days / at least 24 hours ;	**2**
4(b)	boiling water ; (hot) alcohol ; hot water bath ; blue-black ;	**4**
4(c)	starch masks result / to measure starch made in the leaf (in the experiment) ;	**1**
4(d)	centre of A blue-black ; outside of A brown / orange / yellow ; outside AND centre of B brown / orange / yellow ;	**3**

Question	Answer	Marks
5(a)	130.95 ;	**1**
5(b)(i)	1.82 g ;	**1**
5(b)(ii)	reagents not pure / incorrectly measured reagents ;	**1**
5(c)	to stop acid spitting **out** ;	**1**
5(d)(i)	points plotted correctly ;	**1**
5(d)(ii)	line of best-fit ;	**1**
5(e)(i)	line **F** same as gradient at start/slightly steeper **and** same starting point ; line (plateauing at) 129 / 128.8 ;	**2**
5(e)(ii)	line **M** steeper at start and same starting point ; line stops at same value ;	**2**

Question	Answer	Marks
6(a)(i)	3.7 ; 3.2 ;	**2**
6(a)(ii)	3.5 ;	**1**
6(a)(iii)	times very short / human reaction time :	**1**
6(a)(iv)	to identify anomalies / reduce effects of errors ;	**1**
6(a)(v)	as h increases speed increases ;	**1**
6(b)(i)	timer stopped late / timer started early / not timed between points P and Q ;	**1**
6(b)(ii)	1.9 ;	**1**
6(c)	any **two** from: height of the ramp ; size of the ball ; material of the ball ; surface of the ramp ;	**2**