Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICAL SCIENCE **0652/61**

Paper 6 Alternative to Practical **October/November 2016**

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	Answers	Marks
1(a)(i)	pestle and mortar ;	1
1(a)(ii)	bubbles will stop ;	1
1(a)(iii)	draw filter funnel and receptacle ; complete piece of filter paper ; filtrate and residue labelled correctly ;	3
1(a)(iv)	heat / boil ; saturate / remove some of water / crystalisation point / partly evaporate ; cool / leave ;	3
1(b)(i)	heat (until white) ;	1
1(b)(ii)	blue ;	1
	Total	10

Question	Answers	Marks
2(a)(i)	add sodium hydroxide (solution) / NaOH ; green ppt ;	2
2(a)(ii)	add dilute nitric acid / HNO_3 ; then add barium nitrate solution / $Ba(NO_3)_2$; white ppt. ;	3
2(b)(i)	hydrogen / H_2 ;	1
2(b)(ii)	white ppt ; ppt dissolves / becomes colourless solution / soluble in excess ;	2

Question	Answers	Marks
2(c)(i)	displacement / redox / cation reduced / it is reduced / Fe^{2+} goes to Fe / it is replaced by Mg / it is replaced by Mg^{2+} ;	1
2(c)(ii)	exothermic ;	1
	Total	10

Question	Answers	Marks
3(a)(i)	6.5 ;	1
3(a)(ii)	65 ;	1
3(a)(iii)	Appropriate precaution (either written or shown on diagram) ; e.g. take reading at eye level / use of set square to ensure rule vertical / use of fiducial aid	max 1
3(b)	31.0 ;	1
3(c)	T = 1.55 ; T^2 = 2.4 ;	2
3(d)	Suitable choice of scales (more than half the grid used) ; At least 4 plots correct to ½ small square ; Good best-fit straight line with a ruler, omission of anomalous point ;	3
3(e)	Yes agree (no mark) (straight) line through the origin No disagree (No mark) all points / anomaly not on the (straight) line	max 1
	Total	10

Question	Answers	Marks
4(a)(i)	variable resistor ;	1
4(a)(ii)	to mix ice and steam ;	1
4(a)(iii)	**all** water / **all** liquid / **no** ice ;	1
4(b)	260 ; $260 \times 5 \times 24 = 31\,200$ J ;	2
4(c)(i)	113 ;	1
4(c)(ii)	(13 g of) condensed / liquefied steam ;	1
4(di	Any 2 steam condensing / cooling <u>in the tube</u> / on the way to the ice ; not all steam heats the ice ; ice takes in heat from the environment ;	2
4(d)(i)	insulation / lid ;	1
	Total	10

Question	Answers	Marks
5(a)(i)	oxygen / O_2 ;	1
5(a)(ii)	Hydrogen / H_2 ;	1
5(b)(i)	litmus **OR** UI ;	1
5(b)(ii)	gas will not change the colour of red **and** blue litmus / UI **and** green or pH 7 ;	1
5(c)	diagram showing the inverted **test**-tube with the open end under water ; water risen into the test-tube ;	2
5(d)	gas **V** = ammonia / NH_3 ; gas **W** = hydrogen chloride / HCl / sulfur dioxide / SO_2 ;	2
5(e)	add limewater to test-tube and shake ; (limewater goes) white precipitate / milky ;	2
	Total	10

Question	Answers	Marks
6(a)	A in series with the power source **AND** V in parallel ;	1
6(b)	0.65 (A) ; 1.5 (V) ;	2
6(c)	wire **L** = 1.5 ; wire **M** (= 1.5 / 0.65 =) 2.3 ; ohms / Ω ;	3
6(d)	minimum of 3 lengths ; minimum 10cm range ; control **ONE** from material / cross-section / temperature ; graph of resistance against length ;	4
	Total	10