Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

PHYSICAL SCIENCE **0652/62**

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)	1.10 g ;	1
1(b)	Only very slightly soluble inwater / insoluble (in water) ;	1
1(c)(i)	225 ;	1
1(c)(ii)	0.9375 / 0.94 (accept 0.9) ;	1
1(d)(i)	filter funnel and filter paper shown and labelled ;	1
1(d)(ii)	0.16 ;	1
1(d)(iiii)	(1.10 – 0.16) = 0.94 ;	1
1(e)(i)	0.9375 / 1.10 × 100 = 85 / 85.2 (%) ; ecf from **(a)** and **(c)(ii)**	1
1(e)(ii)	0.94 / 1.10 × 100 = 85 / 85.5 (%) ; ecf from **(a)** and **(d)(iii)**	1
1(f)	(Magnesium carbonate) reacts like calcium carbonate / also gives carbon dioxide / results in too much carbon dioxide / is not in the residue ;	1
	Total:	10

Question	Answers	Marks
2(a)(i)	copper / Cu ;	1
2(a)(ii)	23.0 ; 38.5 ;	2

Question	Answers	Marks
2(b)(i)	54(.0), 41.5, 30(.0), 15.5 ; ecf	1
2(b)(ii)	vertical scale linear and uses more than half of grid ; minimum of 3 points plotted correctly to within half a small square ; best straight line through origin ;	3
2(b)(iii)	agrees as all points close to / on straight line (through origin) ;	1
2(c)(i)	exothermic ;	1
2(c)(ii)	lid / insulation around cup / more accurate thermometer / repeat with different concentrations (extra points) ;	1
	Total:	10

Question	Answers	Marks
3(a)	note the reading on either side and find mean / shown on a diagram / measure cube and mark the mid point ;	1
3(b)(i)	36 (.0) ;	1
3(b)(ii)	21 (.0) cm ;	1
3(b)(iii)	14 (.0) cm ;	1
3(c)(i)	84.4 g ;	1
3(c)(ii)	56 to 56.2666… ; 56 / 56.3 g (2 / 3 significant figures) ;	2

Question	Answers	Marks
3(d)	any 2 centre of gravity of the rule not at the 50 cm mark ; difficulty in obtaining balance of ruler ; pivot not at right angles to edge of rule ; cube irregular ; ruler mass rounded ;	**max 2**
3(e)	*a* smaller and *b* greater ;	**1**
	Total:	**10**

Question	Answers	Marks
4(a)(i)	slit in a card (after lamp) ;	**1**
4(a)(ii)	light ray bends towards the normal as it enters water solution **and** meets P_w ; incident and refracted rays are parallel ;	**2**
4(a)(ii)	1.1 cm (± 0.1 cm) ;	**1**
4(a)(ii)	both angles of incidence and refraction correctly labelled ;	**1**
4(a)(ii)	2.0 cm (± 0.1 cm) ;	**1**
4(a)(ii)	the angle of refraction is greater when the light ray passes through glass / glass bends light more than water ;	**1**
4(b)(i)	reasonable accurate reflected ray drawn ; reflected angle marked between drawn normal and ray ;	**2**
4(b)(ii)	70° ;	**1**
	Total:	**10**

Question	Answers	Marks
5(a)(i)	ammonia / NH_3 ;	1
5(a)(ii)	white precipitate / white solid ;	1
5(a)(iii)	add silver nitrate ; white precipitate ;	2
5(a)(iv)	blue ppt. ;	1
5(b)(i)	measuring cylinder / pipette / burette ;	1
5(b)(ii)	UI ; red to green ;	2
5(b)(iii)	salt would be impure / salt would be coloured ;	1
5(b)(iv)	heat ;	1
	Total:	10

Question	Answers	Marks
6(a)	64 (**F**) ; 49 (**G**) ;	2
6(b)	axes labelled with units ; suitable scales chosen for axes using at least half of grid ; at least 4 points plotted ± ½ square for each container ; smooth curves drawn (and labelled) ;	4
6(c)(i)	**G** is better (no mark) because the temperature fell more rapidly / lower curve ;	1

Question	Answers	Marks
6(c)(ii)	named non-metallic material for **F**, e.g. polythene / wood / plastic ; named metallic material for **G**, e.g. copper / metal ;	**2**
6(d)	value in region 21 to 40 °C ;	**1**
	Total:	**10**