Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

PHYSICAL SCIENCE **0652/61**

Paper 6 Alternative to Practical **October/November 2017**

MARK SCHEME

Maximum Mark: 60

Published

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Question	Answer	Marks
1(a)(i)	23.5 ;	**1**
1(a)(ii)	5.0, 3.0, 16.5 ;	**1**
1(b)(i)	most = **N** then **L** and least = **M** ; faster bubbles means (metal) more reactive ; highest temperature (change) means (metal) more reactive ;	**3**
1(b)(ii)	pieces (of metal) same shape / same mass (of metal) / same subdivision / same surface area / same acid concentration ;	**1**
1(c)	lighted splint **AND** pop ;	**1**
1(d)(i)	Filtration / filter(ing) ;	**1**
1(d)(ii)	sodium hydroxide (solution) / ammonia solution / aqueous ammonia / ammonium hydroxide ;	**1**
1(d)(iii)	iron / Fe ;	**1**

Question	Answer	Marks
2(a)	(**G** is) sulfuric acid ; acid and carbonate gives carbon dioxide ;	**2**
2(b)	(**D** is) iron(III) nitrate ; **(E** and **H** are) sodium hydroxide and ammonia (but order not known) / (**E** and **H** are) alkalis / alkaline ;	**2**
2(c)	(**F** is) barium chloride ; barium chloride gives white ppt. with sulphate / sulfuric acid / acid ;	**2**

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Question	Answer	Marks
2(d)	copper sulfate solution ; excess sodium hydroxide gives blue ppt. ; excess ammonia gives dark blue solution ;	**3**
2(e)	barium chloride / F **and** white ppt. ;	**1**

Question	Answer	Marks
3(a)(i)	s, °C, °C ;	**1**
3(b)	84 ;	**1**
3(c)	79 ;	**1**
3(d)	to allow thermometer reading to attain maximum temperature / wtte ;	**1**
3(e)	(No significant effect) as very similar / same drop in temp. ; in same time ; **OR** (Decreases) as smaller drop in temp. ; in same time ;	**1** **1**
3(f)(i)	use a lid ;	**1**
3(f)(ii)	lag the bottom of the beaker / thicker insulation / avp ;	**1**
3(g)	Any 2 from: room temperature ; initial hot water temperature ; volume / amount of water ;	**2**

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Question	Answer	Marks
4(a)(i)	4.0 ± 0.1 ;	1
4(a)(ii)	20.0 ;	1
4(a)(iii)	inverted triangle seen ;	1
4(b)(i)	80.0, 67.5, 64.0 all values correct ;	1
4(b)(i)	Any 1 from: move screen slowly to / fro until sharpest focus obtained ; repeat each reading and average ; 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 ;	1
4(c)(i)	plots correct to half a small square, at least 6 correct ; good best-fit curve judgement ;	2
4(c)(i)	60 ± 0.5 ;	1
4(d)	15 ; 2 / 3 s.f. only	2

Question	Answer	Marks
5(a)(i)	measuring cylinder ;	1
5(a)(ii)	conical flask ;	1
5(b)(i)	25.08 ;	1
5(b)(ii)	77.20 ;	1
5(b)(iii)	76.15 / 76.16 ;	1

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Question	Answer	Marks
5(b)(iv)	77.20 plotted ± half small square **and** curve completed ;	**1**
5(c)(i)	rate decreases as acid concentration decreases ;	**1**
5(c)(ii)	temperature affects rate / to ensure temperature has remained constant ;	**1**
5(d)(i)	Volume / amount of gas ;	**1**
5(d)(ii)	diagram showing gas syringe / inverted measuring cylinder over water ;	**1**

Question	Answer	Marks
6(a)	12 ;	**1**
6(b)	aluminium absorbs / stops alpha **and** beta ; gamma rays pass through ;	**2**
6(c)	877, 220, 97, 55, 36, 25	**1**
6(d)	suitable choice of scales linear and half the grid used ; all 6 plots correct to half a small square scores 2 marks ; 5 correct scores 1 ; smooth curve ;	**4**
6(e)(i)	distant from source owtte ;	**1**
6(e)(ii)	protective clothing / use tongs / short exposure time / keep source in lead-lined container ;	**1**

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