Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/62**

Paper 6 Alternative to Practical **May/June 2017**

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 using at least half the space and not feathery ; male parts – anther and filament ; female parts – stigma (and ovary) ; some petals ;	**4**
1(a)(ii)	*correctly labelled:* anther ; stigma ;	**2**
1(b)(i)	2 lines drawn edge to edge ; correct measurement of photograph 47 mm ± 1 mm **AND** (sensible) flower measurement (larger than photograph) ;	**2**
1(b)(ii)	correct calculation ;	**1**
1(c)	stigma circled (on Fig.1.1) ;	**1**

Question	Answer	Marks
2(a)(i)	all values of *V* correct 7, (10), 14, 21 ;	**1**
2(a)(ii)	axes labelled with units ; linear scales using at least half of grid in each direction ; at least three points plotted correctly within half a small square ; best straight line **or** best curve ;	**4**
2(a)(iii)	the higher the temperature the higher the rate of the reaction ;	**1**
2(b)(i)	removes timing error associated with starting the stopclock and connecting apparatus / could be too fast in first minute due to powder on chips / air in measuring cylinder ;	**1**
2(b)(ii)	the surface area (of the chips) is reduced / reaction slowed by smaller chips ;	**1**
2(b)(iii)	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 in a certain time / time for certain drop in mass ;	**max 2**

Question	Answer	Marks
3(a)(i)	51.3 (g) ;	**1**
3(a)(ii)	67 (cm^3) ;	**1**
3(a)(iii)	read to bottom of meniscus / take reading at eye level / perpendicular to scale ;	**1**
3(a)(iv)	1.03 ; g / cm^3 ;	**2**
3(b)(i)	18 (cm^3) ;	**1**
3(b)(ii)	($\frac{18.1}{(b)(i)}$) 1.0 / 1.01 (g / cm^3) ; 2 or 3 significant figures ;	**2**
3(c)(i)	zero error on balance / test-tube touching side of cylinder ;	**1**
3(c)(ii)	measuring cylinder otherwise wet / contains some water when its 'dry' mass is measured ;	**1**

Question	Answer	Marks
4(a)	leave in the dark ; at least 24 hours ;	**2**
4(b)(i)	alcohol and warm (to take out chlorophyll) ; iodine (solution) ; (brown) to blue-black ;	**3**
4(b)(ii)	Benedicts (solution) ; heat ; red (most sugar) / orange / yellow (less) / green (little) ;	**3**
4(b)(iii)	no naked flame ethanol flammable / use water-bath with ethanol as ethanol flammable / goggles chemicals in eyes / don't touch hot apparatus will burn hands / heatproof gloves so don’t burn hands / gloves stop chemical burns ;	**1**
4(c)	light **AND** carbon dioxide needed (for photosynthesis) ;	**1**

Question	Answer	Marks
5(a)(i)	solid in beaker / solution / mixture ;	**1**
5(a)(ii)	make sure that all the acid has reacted ;	**1**
5(a)(iii)	filtration ;	**1**
5(b)(i)	(all water gone) decomposes (to copper oxide) ;	**1**
5(b)(ii)	evaporate some of the water / leave to evaporate / heat / evaporate ; leave to crystallise / cool ; filter ; leave to dry / press between filter paper ;	**max 3**
5(c)	add barium nitrate / barium chloride **AND** white ppt. ;	**1**
5(d)	zinc oxide ; hydrochloric acid ;	**2**

Question	Answer	Marks
6(a)(i)	pipette / syringe ;	**1**
6(a)(ii)	same surface (area) / so same (rate of) evaporation ;	**1**
6(b)(i)	27.5 (°C) ; 14.0 (°C) ;	**2**
6(b)(ii)	17.8 (°C) ; 9.0 (°C) ;	**2**
6(c)(i)	180 (s) ;	**1**
6(c)(ii)	cotton wool dropped off / misread thermometer ;	**1**
6(d)	cotton wool almost dry / rate of evaporation slower / most alcohol evaporated / all alcohol evaporated ;	**1**
6(e)	reasonable sketch (left to right curve, starting high on LHS) ;	**1**