Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE **0653/62**

Paper 6 Alternative to Practical **May/June 2019**

MARK SCHEME

Maximum Mark: 40

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)	as a control / to compare (with enzyme) ;	**1**
1(a)(ii)	temperature / mass/amount of apple / pH / volume/amount added / surface area of pieces/size of pieces ;;	**2**
1(b)(i)	*any three from:* funnel ; filter / filtration paper in funnel with 'V' at bottom ; collection of juice ; at least any two labels;	**max 3**
1(b)(ii)	24.0 **and** 18.5 ;	**1**

Question	Answer	Marks
2	**1 apparatus** potometer / balance / shoot in water ; stop-clock ; suitable container / bell jar / bag / box (to contain moist air) ; **2 method** plant in different levels of moisture ; same amount of time ; repeat experiment at each level of moisture ; safety linked to apparatus / hygiene / procedure ; **3 control of variables** control size / type of plant / number / surface area / size of leaves ; control wind / temperature / (sun)light ; control amount of water given to plant ; **4 measurements, processing and use of results** (dependent variable is) movement of water / bubble / meniscus in potometer / weight loss of leaves / weigh plant or leaves before and after ; measure humidity ; calculate rate of water loss / transpiration / mass lost per unit time ; graph of mass lost against humidity ; compare e.g. mass / water lost in dry and humid / compare mass at different humidities ;	**7**

Question	Answer	Marks
3(a)	10 ; 34 ;	**2**
3(b)(i)	axes labelled with units ; linear scale more than half grid ; at least 5 points plotted correctly to within half a small square ;	**3**
3(b)(ii)	10 circled and too little / impure sodium sulfate ;	**1**
3(b)(iii)	(straight) line not including the anomalous point ;	**1**
3(b)(iv)	as volume / amount increases (height of)ppt increases ORA / (directly) proportional ;	**1**
3(b)(v)	value from graph(to nearest half square) **and** indication on graph ;	**1**
3(b)(vi)	increases and stops / no further increase / stays at 36 / the same ; reagent(s) (all)used up / reaction finished / sodium sulphate now in excess ;	**2**
3(c)	*any 2 from:* volumes with burette / syringe **and** difficult to judge / read ORA with mc ; ruler without dead space **and** difficult to get actual length due to the dead space (so had to pick up tube and not level etc.) ; leave to settle longer **and** some ppt was still suspended / solution above ppt not colourless / clear OR shake / magnetic stirrer to avoid loss of solid on withdrawn glass rod ; repeat **and** reduces errors / spots anomalies ; AVP ;	**max 2**

Question	Answer	Marks
4(a)(i)	place empty measuring cylinder on balance AND tare / zero ; fill to 100 ml **and** find new mass ; **or** find mass of empty and filled measuring cylinder ; subtract ;	**2**
4(a)(ii)	14.5 (°C) ;;	**2**
4(a)(iii)	21.51 (g) ;	**1**
4(b)(i)	ensures all water at same temperature OWTTE ORA ;	**1**
4(b)(ii)	otherwise you will be measuring both water / melted ice and ice / presence of water / melted ice makes mass / it inaccurate OWTTE ;	**1**
4(c)(i)	7.5 (°C) ;	**1**
4(c)(ii)	correct calculation ; (100.05 × 4.2 × 7.5) 3200 (J) answer to 2 sig figs ;	**2**
4(d)(i)	11.56 (g) (21.51 – 9.95) ;	**1**
4(d)(ii)	3860 (J) (11.56 × 334) ;	**1**
4(e)	(energy has come from) the glass / (surrounding) air	**1**