



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.

Cambridge International will not enter into discussions about these mark schemes.

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This document consists of **7** printed pages.

PUBLISHED**Generic Marking Principles**

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptors for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct/valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

GENERIC MARKING PRINCIPLE 5:

Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).

GENERIC MARKING PRINCIPLE 6:

Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

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)	<i>any three from:</i> 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	<p>1 apparatus potometer / balance / shoot in water ; stop-clock ; suitable container / bell jar / bag / box (to contain moist air) ;</p> <p>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 ;</p> <p>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 ;</p> <p>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 ;</p>	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 OR / (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)	<p><i>any 2 from:</i> volumes with burette / syringe and difficult to judge / read OR with mc ;</p> <p>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.) ;</p> <p>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 ;</p> <p>repeat and reduces errors / spots anomalies ;</p> <p>AVP ;</p>	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 ; $(100.05 \times 4.2 \times 7.5)$ 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