



Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE

0653/61

Paper 6 Alternative to Practical

May/June 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.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2016 series for most Cambridge IGCSE[®], Cambridge International A and AS Level components and some Cambridge O Level components.

© IGCSE is the registered trademark of Cambridge International Examinations.

This document consists of **4** printed pages.

Page 2	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2016	0653	61

- 1 (a) time/minutes ;
volume/cm³ ; [2]
- (b) 6.8 ; 0.5 ; [2]
- (c) both axes labelled at least one with units ;
linear scale covering >1/2 paper ;
at least 4 plots correct ± half square ;
best fit line ; [4]
- (d) increases amount of juice produced / more juice per unit time ; [1]
- (e) keeps volume in each beaker constant / show that the water of enzyme solution
does not have an effect / no effect without enzyme ; [1]

[Total: 10]

- 2 (a) (i) 124 ; [1]
- (ii) C is 2.00 mol dm⁻³
D is 0.50 mol dm⁻³
E is 1.00 mol dm⁻³;; [2]

one correct = 1 mark, three correct = 2 marks

- (b) add marble chip / add UI / add Mg ;
- (marble chips or magnesium) count bubbles / collect gas / measure volume of gas ;
in a certain time ;
OR
(for marble chips) time ;
for limewater to go milky ;
OR
add NaOH from measuring cylinder / burette ;
until UI just green ;
- the more bubbles or gas the more concentrated / the shorter the time (for
limewater) the more concentrated / the more NaOH the more concentrated ;
- equal volumes of the acids (in test-tubes) ; [5]
- (c) (acidified) silver nitrate / AgNO₃ AND white ppt. ; [1]
- (d) too long for magnesium to disappear / reaction too slow ; [1]

[Total: 10]

Page 3	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2016	0653	61

3 (a) $p = 29.5 \text{ cm}$; [1]

(b) x values correct (e.c.f. p)
24.5 ecf, (21.8), **19.1, 16.4, 13.6** ;

y values correct
20.5 ecf, (18.2), **15.9, 13.6, 11.4** ; [2]

(c) (i) suitable choice of scales $\geq \frac{1}{2}$ the grid (can plot the 5 points) used AND linear ;
minimum 4 plots correct to $\frac{1}{2}$ small square on easy to read scale ;
good best fit straight line judgement ; [3]

(ii) indication on graph of how the data were obtained AND more than half the line ;
calculation correct ; [2]

(d) m correct to 2/3 significant figures ; [1]

(e) **Any one from:**

difficulty in obtaining balance ;
centre of mass of rule not at the 50.0 cm mark ;
load not uniform ;
difficulty in placing the centre of load over the mark on the rule ; [1]

[Total: 10]

4 (a) placed in the dark ;
at least 24 hours ; [2]

(b) (i) potassium hydroxide/sodium hydroxide/soda lime ; [1]

(ii) any in the same state as (i) that does not absorb CO_2 ; [1]

(c) (i) iodine solution ;
boiling/hot water ;
hot alcohol/ethanol ;
rinse with water ;
(safety) water bath/not naked flame ; [max 4]

(ii) G is blue-black AND F is brown/orange ;
(because) G can photosynthesise and F cannot (photosynthesise) ;

OR

F is brown no photosynthesis ;
G is blue-black can photosynthesise ; [2]

[Total: 10]

Page 4	Mark Scheme	Syllabus	Paper
	Cambridge IGCSE – May/June 2016	0653	61

- 5 (a) (i) limewater ;
white ppt. ; [2]
- (ii) diagram showing filter funnel and paper ;
two relevant labels ; [2]
- (iii) blue ppt. AND blue ppt. ;
(deep) blue solution ; blue ppt. ; [3]
- (b) copper carbonate / CuCO_3 ; [1]
- (c) use of (acidified aqueous) barium chloride / barium nitrate ;
white ppt. etc. ; [2]

[Total: 10]

- 6 (a) (i) 112 ; [1]
- (ii) correct symbol for ammeter and voltmeter ;
ammeter in series and voltmeter in parallel ;
correct symbols for lamp and switch in series ;
workable circuit (no short circuits, no gaps) ; [4]
- (iii) 54 and 21 ;
33 (ecf) ; [2]
- (iv) $112 \text{ (ecf)} \times 33 \text{ (ecf)} \times 4.2 / 1000 = 15.5 / 16$; [1]
- (b) air / surroundings ;
wires / leads / (heater) casing / circuit ;
AVP e.g. heat transferred to: beaker / used in evaporation ; [max 2]

[Total: 10]