



Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

COMBINED SCIENCE

0653/63

Paper 6 Alternative to Practical

October/November 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.

Cambridge International is publishing the mark schemes for the October/November 2019 series for most Cambridge IGCSE™, Cambridge International A and AS Level components and some Cambridge O Level components.

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

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)	(so that) <u>all</u> surface area in contact with solution / <u>all</u> potato tissue is in contact with (sugar) solution / <u>all</u> potato tissue affected / to allow comparison between tubes ;	1
1(a)(ii)	55 and 52 ± 1 ;	1
1(a)(iii)	-5 and -8 ;	1
1(a)(iv)	-6.5 ;	1
1(a)(v)	18% ;	1
1(b)(i)	(increased in length as) <u>water</u> entered potato / more sugar in potato / lower concentration of water in the potato ;	1
1(b)(ii)	same concentration of sugar / water in potato and solution ;	1
1(c)(i)	$0.1 < \text{value} < 0.3$;	1
1(c)(ii)	<i>any three from:</i> temperature ; type of potato ; same potato ; diameter of potato ; volume of solution ; (initial) length ; time ;	3
1(d)	add iodine ; (positive) blue-black / black and (negative) brown ;	2

Question	Answer	Marks
2(a)(i)	lighted splint and pops ;	1
2(a)(ii)	G sodium hydroxide / NaOH and E sodium / Na ;	1
2(a)(iii)	calcium / Ca ²⁺ / copper / Cu ²⁺ / Iron(III) / Fe ³⁺ / zinc / Zn ²⁺ ;	1
2(b)(i)	one sealed container containing reaction mixture and delivery tube ; tube enters solution H in a an open container ;	2
2(b)(ii)	limewater ;	1
2(b)(iii)	calcium ;	1

Question	Answer	Marks
3	<p><i>one mark from each section and then any other 3 marks from:</i></p> <p>1. apparatus gas collection: measuring cylinder to collect gas / burette / (gas) syringe / balance (to measure change in mass) ; measuring cylinder (to measure volume of hydrogen peroxide) ; timer / stopwatch ;</p> <p>2. method reactants in a container with delivery tube into gas syringe or upturned container in water ; measure amounts of gas and take readings of time ; use same amounts of hydrogen peroxide <u>and</u> oxide(s) ; wear goggles to prevent hydrogen peroxide or oxides from harming / entering eyes ; repeat (for the same oxide) ;</p> <p>3. measurements and control measure <u>volume</u> hydrogen peroxide / specific amount / same <u>concentration</u> hydrogen peroxide ; same <u>mass</u> oxide (catalyst) ; measure volume / mass of gas given off in fixed time / measure time to collect fixed volume / mass of gas ;</p> <p>4. processing and use of results calculate average from repeated readings ; same volume least time is best catalyst / same volume most time is worst catalyst or same time largest volume collected is best catalyst / same time smallest volume collected is worst catalyst ; describe how to calculate a rate, e.g. cm^3/s or $1/t$;</p>	7

Question	Answer	Marks
4(a)	<u>0.30</u> ;	1
4(b)	0.77 / 0.767 ; answer to 2 decimal places ;	2
4(c)(i)	axes correct way round and axes correctly labelled with units ; suitable linear scale so plots occupy at least half of grid ; five points correctly plotted to $\pm \frac{1}{2}$ small square ;	3
4(c)(ii)	smooth curve with single, unbroken line through or near to all points ;	1
4(d)	as distance increases less force is required ora ; non-linear relationship / bigger change in force at small distances ora ;	2
4(e)(i)	<i>any two from:</i> B has most appropriate resolution for the readings / divisions are suitable for the readings ; B covers the range of the readings / has a larger (maximum) value than the readings / high enough for the readings / goes to 5 N ; A has big gaps (between divisions) / each division in A is 2.0 N / difference between readings too big / scale is too large ; C cannot measure (some of) values (in the table) / C cannot measure above 1 N / C does not measure high enough ;	2
4(e)(ii)	line at 1.8 N marked on newton meter B in Fig. 4.3 ;	1
4(f)	difficult to read newton meter (while door is moving) / difficult to ensure newton meter is pulled horizontally / at right angles / difficulty in pulling newton meter smoothly / meter reading varies ;	1