Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

Cambridge IGCSE

COMBINED SCIENCE	**0653/52**
Paper 5 Practical Test	**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.

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

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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)	value recorded less than 10.0 ;	**1**
1(b)	second value matches first value ± 1.0 cm^3 ;	**1**
1(c)(i)	correct calculations totalling 10.0 ;	**1**
1(c)(ii)	correct average calculated ;	**1**
1(d)	two values recorded in table for iodine remaining **and** sum of iodine remaining + iodine added = 10.0 ; values for **iodine added** are less than experiment A ;	**2**
1(e)	correct statement based on average values ;	**1**
1(f)(i)	correct calculation of concentration ; 1 or 2 s.f.;	**2**
1(f)(ii)	add fewer drops each time / use burette ;	**1**
1(g)	fills more than 50% space ; continuous line around outside and segments ; pith and centre shown ;	**3**

Question	Answer	Marks
2(a)(i)	green (powder) **and** black (powder) ;	1
2(a)(ii)	milky **and** carbon dioxide ;	1
2(a)(iii)	carbonate ;	1
2(b)(i)	blue (solution) **and** blue ppt ;	1
2(b)(ii)	green-blue ;	1
2(b)(iii)	copper/ Cu^{2+} ;	1
2(c)	ammonia solution **and** (blue) ppt dissolves to give (blue) solution ;	1

Question	Answer	Marks
3	*one mark from each section and then any other 3 marks from:* **1. apparatus** flask / test-tube / boiling-tube and heating apparatus, e.g. Bunsen burner ; (gas) syringe / measuring cylinder to collect gas / burette / weighing scale ; measuring cylinder to measure fizzy drink ; **2. method and safety** drink in a container with delivery tube into gas syringe or upturned container in water ; heat / leave (until no more gas is given off) / shake (until no more gas is given off) ; wear goggles when heating / wear goggles to prevent (hot) fizzy drink from going into eyes / take precaution against hot apparatus, e.g. tongs, wait for apparatus to cool before touching, use heat gloves to protect against burning ; repeat for same type of fizzy drink ; **3. measurements and control** same amount of drink used / quotes volume of drink used / measures volume or mass of drink used ; measure <u>volume</u> of CO_2 evolved / measure <u>mass</u> lost ; to constant volume of gas / to constant mass ; **4. processing and use of results** calculate average amount of CO_2 evolved for each type of drink (if measurements repeated) ; compare volume/mass of CO_2 / largest volume collected has most CO_2 / smallest volume collected has least CO_2 / largest loss in mass has most CO_2 / smallest loss in mass has least CO_2 ;	7

Question	Answer	Marks
4(a)(i)	reasonable time recorded (10–20) to 0.01 s ;	1
4(a)(ii)	correct average to nearest 0.01 s ;	1
4(a)(iii)	full set of results recorded ; all average times decreasing with decreasing length ;	2
4(a)(iv)	(time for complete swing is when bob crosses …) retort stand upright / line drawn on card / any sensible description that shows attempt to time from a point in swing to same point in swing ;	1
4(a)(v)	reaction time of humans / human error in timing / one oscillation is too short to time accurately / difficult to start/stop at exactly the right time ; reduced percentage uncertainty / uncertainty spread over more oscillations / uncertainty less significant over more oscillations ;	2
4(a)(vi)	correct calculation of T ;	1
4(a)(vii)	correct calculation of T^2 ;	1
4(b)(i)	axes right way round with linear scale so that plots occupy at least half of grid, starting from 0 ; correct plots to ± ½ small square ;	2
4(b)(ii)	appropriate best-fit line based on their plots ;	1
4(c)	T^2 is (directly) proportional to l ;	1