



**Cambridge Assessment International Education**  
Cambridge International General Certificate of Secondary Education

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**COMBINED SCIENCE**

**0653/61**

Paper 6 Alternative to Practical

**October/November 2019**

MARK SCHEME

Maximum Mark: 40

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**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.

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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)	7.5 / 8(%);	1
1(a)(ii)	<b>A</b> 35 and <b>B</b> 20 ; <b>C</b> 120 ; <b>D</b> > 300 ;	3
1(a)(iii)	<b>B</b> at top / <b>D</b> at bottom ; correct order <b>B A C D</b> ;	2
1(a)(iv)	as a control / to find out what happens with only water / to find out what happens with no pepsin / to show that pepsin has an effect / to show that pepsin acts as a catalyst ;	1
1(a)(v)	to maintain constant temperature / to maintain optimum temperature for enzymes / to keep at 40 °C ;	1
1(b)	two or more additional values of percentage or volume ; at least one value less than 15% / less than 2 cm <sup>3</sup> ;	2
1(c)	biuret ; lilac / purple / violet / mauve ; blue ;	3

<b>Question</b>	<b>Answer</b>	<b>Marks</b>
2(a)(i)	<b>E</b> acid <b>and</b> <b>F</b> alkali / base ;	<b>1</b>
2(a)(ii)	delivery tube into container of limewater <b>and</b> delivery tube under surface ;	<b>1</b>
2(a)(iii)	hydrogen ;	<b>1</b>
2(a)(iv)	sulfate ;	<b>1</b>
2(a)(v)	sulfuric acid ;	<b>1</b>
2(b)	ammonia / sodium hydroxide ;	<b>1</b>
2(c)	copper(II) <b>and</b> (ammonia =) blue ppt and dark blue solution <b>or</b> (sodium hydroxide =) pale blue ppt ;	<b>1</b>

Question	Answer	Marks
3	<p><i>one mark from each section and then any other 3 marks from:</i></p> <p><b>1. apparatus</b> (allow from a <u>labelled</u> diagram)  sea water in a suitable container <b>and</b> use of heating device / Bunsen burner ;  measuring cylinder ;  filter funnel <b>and</b> filter paper (may be from a diagram if the funnel clearly contains a filter paper) ;  weighing scales ;</p> <p><b>2. method</b>  filter to remove insoluble particles (before heating) ;  heat / leave so that (all) water evaporates ;  repeat for same type of seawater ;  wear goggles when heating / wear goggles to prevent solution or salt from going into eyes / wear gloves so salt water does not touch skin / take precaution against hot apparatus e.g. use tongs, wait for apparatus to cool before touching ;</p> <p><b>3. measurements and control</b>  idea of weighing empty evaporating basin / container ;  same amount of water used / quotes volume of water used / measures volume or mass of water used ;  measure mass / weigh salts after evaporation ;</p> <p><b>4. processing and use of results</b>  calculate average mass of salts for each type of sea-water (if measurements repeated) ;  calculate percentage mass or mass of salts in fixed volume of water ;  compare <u>mass</u> of salts (if same volume used) / states that a larger <u>mass</u> has more dissolved salts ;</p>	7

Question	Answer	Marks
4(a)(i)	78.0 (°C) ;	1
4(a)(ii)	°C ;	1
4(a)(iii)	65.5 (°C) ;	1
4(a)(iv)	reading thermometer perpendicular to the scale / thermometer bulb in centre of liquid / continuous stirring ;	1
4(b)(i)	axes correct way round and axes correctly labelled 'temperature (of water)' and 'time / min' ; suitable linear scale so plots occupy at least half of grid ; five points correctly plotted for either line $\pm \frac{1}{2}$ small square ;	3
4(b)(ii)	smooth best-fit line drawn ; both lines clearly and correctly labelled ;	2
4(c)(i)	(similarity) temperature decreases (with time) (in both experiments) ; (difference) temperature decreases faster in cup without lid <b>ora</b> ;	2
4(c)(ii)	3.5 minutes shown on graph ; candidate's value $\pm 0.5$ (°C) (with a lid) ;	2