



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

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**COMBINED SCIENCE**

**0653/62**

Paper 6 Alternative to Practical

**March 2018**

MARK SCHEME

Maximum Mark: 60

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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.

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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)  | Blue-black indicates starch present (initially);<br>Brown indicates starch breaks down in <b>A</b> ;<br>Starch still remains in <b>B</b> / starch not broken down                 | 3     |
| 1(a)(ii) | Would get brown / starch breaks down faster / AW  | 1     |
| 1(b)     | Benedicts solution;<br>Heat;<br>Yellow / green / orange / red;<br>Wore goggles because of hot water / chemicals / water bath not Bunsen / gloves / lab coat as iodine stains; AVP | 4     |
| 1(c)(i)  | Enzyme / amylase is a protein so could give a positive result; AW   | 1     |
| 1(c)(ii) | (blue--black) colour masks test; AW   | 1     |

| Question  | Answer  | Marks |
|-----------|---|-------|
| 2(a)      | 10 cm <sup>3</sup> and 10 cm <sup>3</sup> ;   | 1     |
| 2(b)(i)   | 28:<br>99 ;   | 2     |
| 2(b)(ii)  | decreasing concentration increases time ;   | 1     |
| 2(b)(iii) | 0.03571 and 0.01010 to any rounding ;<br>0.036 and 0.010 ;                                    | 2     |
| 2(b)(iv)  | both ratios worked out ;<br>same effect as within 10% / same effect as both nearly the same ; | 2     |
| 2(c)(i)   | too corrosive / would be too short a time / would be too fast a reaction ;                    | 1     |

| Question | Answer  | Marks |
|----------|---|-------|
| 2(c)(ii) | starting stopclock after gas begins to be released / irregular size of marble chips / use of measuring cylinder for dilution exercise ; | 1     |

| Question  | Answer  | Marks |
|-----------|---|-------|
| 3(a)(i)   | 1.4(0) (V) ;<br>0.23 (A) ;<br><br><i>I</i> to 2 s.f. and <i>V</i> to 3 s.f. ; | 3     |
| 3(a)(ii)  | V / volt and A / amp ;  | 1     |
| 3(a)(iii) | cell runs down / wire gets hot ;  | 1     |
| 3(b)(i)   | axes labelled ;<br>4 plots correct to half a small square ;                   | 2     |
| 3(b)(ii)  | good best fit line judgement ;  | 1     |
| 3(c)      | extrapolation and value $\pm$ half small square ;                             | 1     |
| 3(d)      | current values too high / cell runs down ;                                    | 1     |

| Question | Answer   | Marks |
|----------|--|-------|
| 4(a)(i)  | Jelly is alkaline;   | 1     |
| 4(a)(ii) | Sodium hydroxide / sodium hydrogen carbonate   | 1     |
| 4(b)     | container and acid level above jelly cube drawn;<br>Labels for container and acid (and jelly cube) | 2     |
| 4(c)     | 5 <b>and</b> 10 mm;  | 1     |

| Question  | Answer   | Marks |
|-----------|--|-------|
| 4(d)      | 59;<br>155;  | 2     |
| 4(e)(i)   | larger cube (has) greater distance (so) time is longer; ORA        | 1     |
| 4(e)(ii)  | large cube is more than twice small cube / large cube is 2.5 times | 1     |
| 4(e)(iii) | Difficulty in deciding end point/cutting cubes exactly / AVP       | 1     |

| Question | Answer  | Marks |
|----------|---|-------|
| 5(a)(i)  | 17 ;  | 1     |
| 5(a)(ii) | test-tube 1...blue ppt. ;<br>test-tube 6...dark blue solution ;   | 2     |
| 5(b)(i)  | to keep total volume the same / so can measure height of ppt. when settles ;  | 1     |
| 5(b)(ii) | curve at bottom of test-tube / different compaction on settling ;   | 1     |
| 5(c)     | the more ammonia solution the higher the ppt. ;<br>height drops / less ppt. ;<br>ppt. dissolves / ppt. disappears / ammonia in excess ; | 3     |
| 5(d)(i)  | ppt. does not dissolve in sodium hydroxide solution ;   | 1     |
| 5(d)(ii) | 26 ;  | 1     |

| Question  | Answer  | Marks    |
|-----------|---|----------|
| 6(a)(i)   | 6.3 ± 0.1 and 2.5 ± 0.1 and 2.5 ± 0.1 ;<br>to nearest millimetre ;            | <b>2</b> |
| 6(a)(ii)  | 39.375 (cm <sup>3</sup> ) ;<br>e.c.f (i)                                      | <b>1</b> |
| 6(a)(iii) | dimensions of block not consistent ;  | <b>1</b> |
| 6(a)(iv)  | 0.8 (N) ;   | <b>1</b> |
| 6(v)      | 2.0(3) (g / cm <sup>3</sup> ) ;   | <b>1</b> |
| 6(b)(i)   | 83 (cm <sup>3</sup> ) ;   | <b>1</b> |
| 6(b)(ii)  | 1.8(6) (g / cm <sup>3</sup> ) ;   | <b>1</b> |
| 6(c)(i)   | Method 2, as dimensions of block irregular ;                                  | <b>1</b> |
| 6(c)(ii)  | modelling clay will get wet/mass of clay increases due to water, or similar ; | <b>1</b> |