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

**CO-ORDINATED SCIENCES** **0654/63**

Paper 6 Alternative to Practical **May/June 2018**

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 International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the May/June 2018 series for most Cambridge IGCSE™, Cambridge International A and AS Level and Cambridge Pre-U components, and some Cambridge O Level components.

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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.

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| GENERIC MARKING PRINCIPLE 5:<br><br>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:<br><br>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) | 20.5 ;<br>26.0 ; | **2** |
| 1(a)(ii) | increases as temperature increases ;<br>increase in temperature increases rate of reaction/photosynthesis ; | **2** |
| 1(a)(iii) | **amount of** pondweed ;<br>more weed produces more bubbles AW ORA ; | **2** |
| 1(b) | no/fewer bubbles **and** light needed for photosynthesis ; | **1** |
| 1(c)(i) | glowing splint **and** relights ; | **1** |
| 1(c)(ii) | bubbles not the same size / volume / bubbles missed in counting ; | **1** |
| 1(c)(iii) | measuring cylinder / burette or gas syringe **and** water in correct place ; | **1** |

| Question | Answer | Marks |
|---|---|---|
| 2(a)(i) | conical flask connected using a bung to… ;<br>…gas syringe / inverted measuring cylinder over water ;<br>at least two correct apparatus labels ; | **3** |
| 2(a)(ii) | no more bubbles / no more gas collected / volume reading remains the same / no solid left / no zinc left ; | **1** |
| 2(b)(i) | scales linear and using at least half of grid ;<br>at least 5 points plotted correctly $\pm \frac{1}{2}$ square (excluding (0,0) ; | **2** |
| 2(b)(ii) | best-fit line ; | **1** |
| 2(b)(iii) | volume at $t$ = 5 mins read from graph $\pm \frac{1}{2}$ square<br>**AND**<br>lines on graph ; | **1** |
| 2(c) | steeper line (and through origin) ;<br>plateau at 96 $cm^3$ ; | **2** |

| Question | Answer | Marks |
|---|---|---|
| 3(a)(i) | 0.18 A ;<br>1.4 V ; | **2** |
| 3(a)(ii) | 0.25(2) (W) ; | **1** |
| 3(a)(iii) | cell / battery will run down ; | **1** |
| 3(b)(i) | 0.32 ;<br>0.29 ; | **2** |
| 3(b)(ii) | 0.61(6) (W) ; | **1** |
| 3(c) | Lamps glow dimmer in series / brighter in parallel ; | **1** |
| 3(d) | (lamp Y) because for same p.d.;<br>current is smaller ;<br>**OR**<br>use *V*/*I* ;<br>correct calculation shown ; | **2** |

| Question | Answer | Marks |
|---|---|---|
| 4(a) | **deep** breath / breathe in **as much as possible** ;<br>breathe out **all** breath **AND** measure new volume ; | **2** |
| 4(b)(i) | (sample B)<br>contains **more** carbon dioxide ;<br>produced in respiration ;<br>**OR**<br>contains l**ess** oxygen ;<br>used in respiration ; | **2** |
| 4(b)(ii) | (bubble through) limewater **and** turns milky ; | **1** |
| 4(c) | values higher for<br>rate ;<br>volume; | **2** |
| 4(d) | find pulse over stated time ;<br>before and after exercise ;<br>repeat and average / sample size and average ; | **3** |

| Question | Answer | Marks |
|---|---|---|
| 5(a) | correct *inert electrodes* label line ;<br>correct *aqueous copper chloride* label line ; | **2** |
| 5(b)(i) | blue litmus / red litmus ;<br>goes white / bleached ; | **2** |
| 5(b)(ii) | (pale) blue ppt. ;<br>dark blue solution ; | **2** |
| 5(c)(i) | 15:00 ; | **1** |
| 5(c)(ii) | 12.14 ; | **1** |
| 5(c)(iii) | (total) mass is proportional to (total) time ;<br>every 300 s mass increases by 0.17 g (or equivalent argument) ; | **2** |

| Question | Answer | Marks |
|---|---|---|
| 6(a) | voltmeter connected in parallel with heating coil ; | **1** |
| 6(b)(i) | to ensure that all the water is at the same temperature ; | **1** |
| 6(b)(ii) | heat still flowing from heater to the water ; | **1** |
| 6(c) | 18 000 (J) ; | **1** |
| 6(d) | substitution / manipulation ;<br>5.45(4545) (J/g°C) ; | **2** |
| 6(e)(i) | heat loss ;<br>taking temperature too soon (as told temperature continues to rise) ;<br>no repeats ; | **2** |
| 6(e)(ii) | insulate the sides / base / use a lid / stir for longer/ until temperature stops rising ; | **1** |
| 6(f) | (rate of)heat loss (from sides / base / surface) is equal to (rate of) heat gain (from heater) ; | **1** |