Cambridge IGCSE

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

**CO-ORDINATED SCIENCES** **0654/05**

Paper 5 Practical Test **For examination from 2019**

MARK SCHEME

Maximum Mark: 60

**Specimen**

This document consists of **7** printed pages and **1** blank page.



CAMBRIDGE International Examinations

**[Turn over**

**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.

mark scheme abbreviations

| | |
|---|---|
| ; | separates marking points |
| / | alternative responses for the same marking point |
| not | do not allow |
| allow | accept the response |
| ignore | mark as if this material was not present |
| ecf | error carried forward |
| avp | any valid point |
| ora | or reverse argument |
| owtte | or words to that effect |
| underline | actual word given must be used by candidate (grammatical variants excepted) |
| ( ) | the word/phrase in brackets is not required but sets the context |
| max | indicates the maximum number of marks |
| any [number] from: | accept the [number] of valid responses |
| note: | additional marking guidance |



**[Turn over**

| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 1(a) | outline concave on one side ;<br>small projections / ridges on the other side ; | **2** | |
| 1(b)(i) | small circles near ridged side ;<br>label line drawn to one circle and labelled 'S' ; | **2** | allow: description for **S** e.g. stained<br>  |
| 1(b)(ii) | xylem ;<br>water transport ; | **2** | allow: water and any idea of movement,<br>ignore: 'absorbs water' |
| 1(c)(i) | a sensible range given that is no lower than 0 °C and no higher than 40 °C ;<br>values given go up in equal intervals / at least 4 values given ; | **2** | |
| 1(c)(ii) | pieces from same celery stalk / same humidity / same amount of air movement / same concentration of coloured water / same length of celery stalk / avp ; | **1** | |

| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 2(a) | results recorded for each vitamin C solution ;<br>result recorded for the fruit juice ;<br>trend: over two adjacent readings for Vitamin C ;<br>trend: over all four adjacent readings for Vitamin C ; | **4** | note: trend: number of drops needed increases as concentration decreases |
| 2(b)(i) | vertical axis is labelled correctly and scale is sensible and linear, over half of the grid used ;<br>all four points plotted correctly ±half a small square ; | **2** | not: awkward scales |
| 2(b)(ii) | suitable straight line for the four points (not including a fruit juice point) ; | **1** | |
| 2(c) | line from number of drops of unknown fruit juice shown on graph / fruit juice point plotted and distinct from other points ;<br>correct vitamin C content reading from graph ; | **2** | |
| 2(d) | wore goggles / tied hair back / avp ; | **1** | |
| 2(e) | carry out the experiment more than once / larger wells / measured drops / smaller bore pipette / avp ; | **1** | |

| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 3(a)(i) | blue / purple **and** pH value in range 8–14 ; | **1** | |
| 3(a)(ii) | calcium oxide / CaO ; | **1** | |
| 3(a)(iii) | basic / alkaline ; | **1** | |
| 3(b)(i) | blue ppt. ; | **1** | |
| 3(b)(ii) | blue ppt. ;<br>forms dark(er) blue solution ; | **2** | |
| 3(b)(iii) | $Cu^{2+}$ ; | **1** | allow: Cu(II) |

| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 4(a)(i) | temperature for time = 0 recorded to nearest 0.5 °C ; | **1** | |
| 4(a)(ii) | all readings entered in table ;<br>maximum by 1.5 minutes **and** continuing to decrease after the maximum ; | **2** | allow: two consecutive same readings for maximum |
| 4(b)(i) | correct $\Delta T$ ecf ; | **1** | |
| 4(b)(ii) | value **and** 2 sf ; | **1** | |
| 4(c) | use a lid ;<br>insulate the beaker ; | **2** | |





**[Turn over**

| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 5 | **apparatus – max 1**<br>suitable collection vessel e.g. gas syringe / inverted measuring cylinder in water trough ;<br>fully labelled diagram showing the gas collection ;<br>**method**<br>minimum of 5 different concentrations ;<br>volume acid / mass Mg ribbon / temperature constant ;<br>wear goggles / not too high a concentration of acid used / wash off skin immediately ;<br>**measurements and processing**<br>time taken to produce certain volume of gas / measurements of gas against time ;<br>plot graph of gas produced in a certain time against concentration ;<br>**use of results**<br>shorter the time / higher the rate the more concentrated the acid ; | **6** | max 6 in total<br>note: to gain 6 marks at least 1 mark must come from each of:<br>• *apparatus*<br>• *method*<br>• *measurements and processing*<br>• *use of results* |



| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 6(a) | sensible $t$ value for 100 g mass ;<br>all $t$ values present ;<br>all $t$ values to nearest 0.1 s and increasing ;<br>$T$ values correct (minimum 2 sig. fig.) **and** $T^2$ values correct (minimum 2 sig. fig.) ; | **4** | note: see supervisor values<br>allow: 0:12 format (minutes: seconds)<br>allow: 0:12.3 format (minutes: seconds)<br>If 0:12 format used for $t$ then $T$ = 12/20 not: 0.12/20 |
| 6(b)(i) | $\frac{39.5 \times 0.10}{T^2 \text{(for 0.1kg)}}$ ; | **1** | |
| 6(b)(ii) | $\frac{39.5 \times 0.50}{T^2 \text{(for 0.5 kg)}}$ ; | **1** | |
| 6(b)(iii) | calculate 5 values of $k$ take average / plot a graph (of $T^2$ against $m$) ; | **1** | |
| 6(c) | time more oscillations ; | **1** | |

| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 7(a)(i) | $l$, $w$, $h$ values present ;<br>to nearest 0.1 cm ; | **2** | |

| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 7(a)(ii) | evaluate $V$ ; | **1** | |
| 7(b)(i) | $x$ present (and to nearest 0.1 cm) ;<br>$x < 40.0$ cm ; | **2** | |
| 7(b)(ii) | correct calculation of $m$ (minimum two significant figures) ; | **1** | |
| 7(b)(iii) | evaluate $d$ to two or three significant figures ;<br>$d$ in range xx–yy ;<br>g / $cm^3$ ; | **3** | value of supervisor ±10% |
| 7(c)(i) | difficulty in moulding a perfect cube / rounded corners / not regular shape / difficulty in accurate balance point / difficulty in finding middle of the block avp ; | **1** | |
| 7(c)(ii) | use a knife to cut the cube / use a balance / hang the cube from the ruler / marking the mid-point on the cube / avp ; | **1** | allow: repeat **and** average results<br>note: improvement should link to answer in **(c)(i)** |
| 7(d) | (none)<br>same material used / shape has no effect on density ; | **1** | |

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