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

**CO-ORDINATED SCIENCES** **0654/53**

Paper 5 Practical Test **October/November 2016**

MARK SCHEME

Maximum Mark: 45

**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 will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2016 series for most Cambridge IGCSE®, Cambridge International A and AS Level components and some Cambridge O Level components.

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>1(a)</td><td>
<table>
<tr><th>nutrient tested for</th><th>testing solution</th><th>heat needed (yes / no)</th></tr>
<tr><td>Protein</td><td>biuret</td><td>no</td></tr>
<tr><td>Reducing sugar</td><td>Benedict’s</td><td>yes</td></tr>
<tr><td>Starch</td><td>iodine</td><td>no</td></tr>
</table>
one testing solution correct ;<br>three testing solutions correct ;<br>heat for reducing sugar only ;
</td><td>3</td></tr>
<tr><td>1(b)</td><td>
<table>
<tr><th>testing solution</th><th>observation</th><th>result</th></tr>
<tr><td>Benedict’s</td><td>blue</td><td>negative</td></tr>
<tr><td>biuret</td><td>purple / lilac</td><td>positive</td></tr>
<tr><td>iodine</td><td>orange</td><td>negative</td></tr>
</table>
1 mark per row ;;;
</td><td>3</td></tr>
</table>

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>1(c)</td><td>
<table>
<tr><td>test solution used</td><td>observation</td><td>result</td></tr>
<tr><td>Benedict's</td><td>yellow / green / orange / red</td><td>positive</td></tr>
<tr><td>biuret</td><td>blue</td><td>negative</td></tr>
<tr><td>iodine</td><td>orange</td><td>negative</td></tr>
</table>
1 mark per row ;;;</td><td>3</td></tr>
<tr><td>1(d)(i)</td><td>same volume of juice ;<br>same volume of Benedict's solution ;<br>yellow / green for small amount of reducing sugar OR orange / red for higher amount of reducing sugar ;</td><td>3</td></tr>
<tr><td>1(d)(ii)</td><td>colour of orange juice masks colour of results / orange is one of Benedict's possible colours ;</td><td>1</td></tr>
<tr><td>1(e)</td><td>dissolve in alcohol AND add water ;<br>milky / cloudy / emulsion ;</td><td>2</td></tr>
<tr><td></td><td>Total:</td><td>15</td></tr>
</table>

| Question | Answer | Marks |
|---|---|---|
| 2(a)(i) | value for $t_1$ for 1.00 Ω ; | **1** |
| 2(a)(ii) | value for $t_2$ for 1.00 Ω **AND (a)(i)** and **(ii)** to nearest second ; | **1** |
| 2(a)(iii) | values for $t_1$ and $t_2$ for 0.75 Ω<br>**AND**<br>values of $t$ greater than those for 1.00 Ω (on average) ; | **1** |
| 2(a)(iv) | values for $t_1$ and $t_2$ for 0.50 Ω<br>**AND**<br>values of $t$ greater than those for 0.75 Ω (on average) ; | **1** |
| 2(b)(i) | all average times $t_a$ correct ; | **1** |
| 2(b)(ii) | all $1/t_a$ values correct **AND** to 3dp ; | **1** |
| 2(c)(i) | linear vertical scale from zero using at least half of the grid ;<br>all three points plotted correctly to within half a small square ;<br>best appropriate line through the origin ; | **3** |
| 2(c)(ii) | statement of relationship between rate and concentration appropriate for line ; | **1** |
| 2(d) | reacted chips will have a smaller surface area / already reacted chips will react slower ; | **1** |
| 2(e)(i) | relationship more reliable / easier to decide position or type of line ; | **1** |
| 2(e)(ii) | (volume of **H)**…….5……..**AND** (volume of water)……15 ; | **1** |

| Question | Answer | Marks |
|---|---|---|
| 2(f) | speed was increased / rate was increased ;<br>by increase in temperature / by more energetic collisions ; | 2 |
| | **Total:** | 15 |

| Question | Answer | Marks |
|---|---|---|
| 3(a)(i) | $V$ recorded ; | 1 |
| 3(a)(ii) | correct symbol for voltmeter ;<br>correct parallel voltmeter connection ; | 2 |
| 3(a)(iii) | $I$ recorded ; | 1 |
| 3(a)(iv) | $R_T$ calculation correct ;<br>ohm / Ω ; | 2 |
| 3(b)(i) | correct series circuit ; | 1 |
| 3(b)(ii) | $V_s$ recorded to at least 1 decimal place **AND** less than 3 V ; | 1 |
| 3(b)(iii) | $I_s$ recorded to at least 2 decimal places **AND** less than 1 A ;<br>$I_s$ less than $I$ ; | 2 |
| 3(b)(iv) | $R_s$ calculation correct ;<br>2 / 3 significant figures ; | 2 |
| 3(c) | (statement) – yes<br>**AND**<br>(justification) – values of $R_T$ and 0.5 $R_2$ are close enough / difference can be attributed to experimental error ; | 1 |
| 3(d) | resistors become hot / resistor values may change ; | 1 |

| Question | Answer | Marks |
|---|---|---|
| 3(e) | reading increases / current is greater ; | 1 |
| | **Total:** | **15** |