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**COMBINED SCIENCE**

**0653/63**

Paper 6 Alternative to Practical

**October/November 2017**

MARK SCHEME

Maximum Mark: 60

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**Published**

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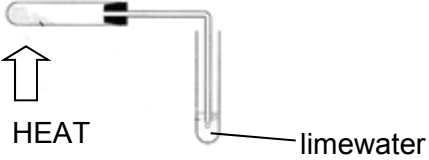
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This document consists of **7** printed pages.

| Question  | Answer  | Marks    |
|-----------|---|----------|
| 1(a)(i)   | Axes correctly labelled: surface area <b>and</b> cm <sup>2</sup> <b>and</b> distance / d <b>and</b> cm ;<br>Suitable linear scale using at least half the grid ;<br>All 4 points plotted correctly ± half small square ;<br>Best fit straight line through origin ; | <b>4</b> |
| 1(a)(ii)  | More enzyme, faster reaction ORA ;  | <b>1</b> |
| 1(a)(iii) | Correct reading from graph ;<br>Lines on graph to show working ;  | <b>2</b> |
| 1(b)      | Any <b>two</b> from<br>temperature ;<br>pH ;<br>pieces from same potato ;<br>concentration of peroxide ;  | <b>2</b> |
| 1(c)      | Glowing splint <b>and</b> relights ;  | <b>1</b> |

| Question                | Answer   | Marks            |               |                         |             |                         |             |          |
|-------------------------|--|------------------|---------------|-------------------------|-------------|-------------------------|-------------|----------|
| 2(a)(i)                 |  <p>apparatus ;<br/><b>H</b> or limewater label and 'HEAT' ;</p>  | <b>2</b>         |               |                         |             |                         |             |          |
| 2(a)(ii)                | to prevent suckback / to stop cold liquid hitting hot solid / to prevent glassware cracking ;  | <b>1</b>         |               |                         |             |                         |             |          |
| 2(a)(iii)               | carbon dioxide (gas) ;   | <b>1</b>         |               |                         |             |                         |             |          |
| 2(a)(iv)                | <b>H</b> is a carbonate ;  | <b>1</b>         |               |                         |             |                         |             |          |
| 2(a)(v)                 | zinc carbonate / $\text{ZnCO}_3$ ;   | <b>1</b>         |               |                         |             |                         |             |          |
| 2(b)(i)                 | white ;  | <b>1</b>         |               |                         |             |                         |             |          |
| 2(b)(ii)                | (white) ppt ;  | <b>1</b>         |               |                         |             |                         |             |          |
| 2(c)(i)                 | <table border="1" data-bbox="353 944 1167 1098"> <thead> <tr> <th>(test / reagent)</th> <th>(observation)</th> </tr> </thead> <tbody> <tr> <td>barium nitrate solution</td> <td>no reaction</td> </tr> <tr> <td>silver nitrate solution</td> <td>yellow ppt.</td> </tr> </tbody> </table> <p>;</p> | (test / reagent) | (observation) | barium nitrate solution | no reaction | silver nitrate solution | yellow ppt. | <b>1</b> |
| (test / reagent)        | (observation)  |                  |               |                         |             |                         |             |          |
| barium nitrate solution | no reaction  |                  |               |                         |             |                         |             |          |
| silver nitrate solution | yellow ppt.  |                  |               |                         |             |                         |             |          |
| 2(c)(ii)                | iodide / $\text{I}^-$ / not sulfate / not $\text{SO}_4^{2-}$ / not chloride / not $\text{Cl}^-$ / not bromide / not $\text{Br}^-$ ;  | <b>1</b>         |               |                         |             |                         |             |          |

| Question  | Answer   | Marks |
|-----------|--|-------|
| 3(a)(i)   | 59.8 (cm) ;  | 1     |
| 3(a)(ii)  | 29.8 (cm) ;  | 1     |
| 3(a)(iii) | 1.0 and 1.7 ;  | 1     |
| 3(a)(iv)  | 2.0 and 2.7 ;  | 1     |
| 3(b)(i)   | plots correct to half a small square, at least 4 correct ;<br>good best fit line judgement ;   | 2     |
| 3(b)(ii)  | indication <u>on graph</u> of how data obtained AND at least half of line used ;<br>correct calculation for triangle method using data from graph ;  | 2     |
| 3(b)(iii) | $(15.0 \pm 1.0) \text{ 2 / 3 s.f. only ;}$   | 1     |
| 3(c)      | any <b>one</b> from<br>move screen slowly to / fro until sharpest focus obtained ;<br>object / lens / screen perpendicular to bench ;<br>object and lens same height above the bench ;<br>carry out experiment away from other bright light sources<br>/ darkened room ; | 1     |

| <b>Question</b> | <b>Answer</b>  | <b>Marks</b> |
|-----------------|--|--------------|
| 4(a)            | (Placed in a suitable dish with) water ;<br>(Kept in a) warm (place) / suitable temperature ;                    | <b>2</b>     |
| 4(b)            | shorter shoot in <b>A</b> ;<br>taller shoot in <b>C</b> ;  | <b>2</b>     |
| 4(c)            | Heat ;<br>Benedicts solution ;<br>Yellow / green / orange / red ;  | <b>3</b>     |
| 4(d)            | Lighting from one side ;<br>Control – even light / in the dark ;<br>More than one seedling (in each condition) ; | <b>3</b>     |

| <b>Question</b> | <b>Answer</b>  | <b>Marks</b> |
|-----------------|--|--------------|
| 5(a)(i)         | alkali / hydroxide ion / OH <sup>-</sup> ;   | <b>1</b>     |
| 5(a)(ii)        | green <b>and</b> ppt. ;  | <b>1</b>     |
| 5(a)(iii)       | aqueous Fe <sup>3+</sup> / dissolve / react with acid ;<br>add (excess) sodium hydroxide solution / ammonia solution ;<br>red-brown and ppt. ; | <b>3</b>     |
| 5(b)(i)         | oil on top label ;<br>boiled water label ;   | <b>2</b>     |
| 5(b)(ii)        | all nails made of iron / steel ;   | <b>1</b>     |
| 5(c)            | need to show that water alone does not cause rusting as in <b>L</b> ;<br>need to show that air alone does not cause rusting as in <b>J</b> ;   | <b>2</b>     |

| Question  | Answer   | Marks    |
|-----------|--|----------|
| 6(a)(i)   | 4.2 ;<br>13.0 ;  | <b>2</b> |
| 6(a)(ii)  | 1,4,6,8 ;<br>all use brick / same block ;<br>all have different surfaces / all surfaces ;  | <b>3</b> |
| 6(a)(iii) | sand<br>carpet<br>wood<br>glass ;  | <b>1</b> |
| 6(b)      | difficult to judge the first pull / accuracy / minimise errors / lessens effects of anomalies AVP ;  | <b>1</b> |
| 6(c)      | would be difficult to stop / slip / slide etc. ;   | <b>1</b> |
| 6(d)      | sand / gravel / very rough tarmac ;<br>high resistance to movement / would slow / stop car quickest / big(gest) resisting force / large(st) friction ; | <b>2</b> |