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**CO-ORDINATED SCIENCES**

**0654/61**

Paper 6 Alternative to Practical

**May/June 2017**

MARK SCHEME

Maximum Mark: 60

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**Published**

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

| Question  | Answer   | Marks         |                   |             |             |        |                                |             |                   |          |             |             |                   |           |             |               |              |          |
|-----------|--|---------------|-------------------|-------------|-------------|--------|--------------------------------|-------------|-------------------|----------|-------------|-------------|-------------------|-----------|-------------|---------------|--------------|----------|
| 1(a)      | Benedict's test ;  | <b>1</b>      |                   |             |             |        |                                |             |                   |          |             |             |                   |           |             |               |              |          |
| 1(b)      | 1 mark per column ;;;<br><table border="1" data-bbox="349 323 1288 550"> <thead> <tr> <th></th> <th>Benedict's test</th> <th>biuret test</th> <th>iodine test</th> </tr> </thead> <tbody> <tr> <td>banana</td> <td><b>yellow/green/orange/red</b></td> <td><b>blue</b></td> <td><b>blue-black</b></td> </tr> <tr> <td>chickpea</td> <td><b>blue</b></td> <td><b>blue</b></td> <td><b>blue-black</b></td> </tr> <tr> <td>egg white</td> <td><b>blue</b></td> <td><b>purple</b></td> <td><b>brown</b></td> </tr> </tbody> </table> |               | Benedict's test   | biuret test | iodine test | banana | <b>yellow/green/orange/red</b> | <b>blue</b> | <b>blue-black</b> | chickpea | <b>blue</b> | <b>blue</b> | <b>blue-black</b> | egg white | <b>blue</b> | <b>purple</b> | <b>brown</b> | <b>3</b> |
|           | Benedict's test  | biuret test   | iodine test       |             |             |        |                                |             |                   |          |             |             |                   |           |             |               |              |          |
| banana    | <b>yellow/green/orange/red</b>   | <b>blue</b>   | <b>blue-black</b> |             |             |        |                                |             |                   |          |             |             |                   |           |             |               |              |          |
| chickpea  | <b>blue</b>  | <b>blue</b>   | <b>blue-black</b> |             |             |        |                                |             |                   |          |             |             |                   |           |             |               |              |          |
| egg white | <b>blue</b>  | <b>purple</b> | <b>brown</b>      |             |             |        |                                |             |                   |          |             |             |                   |           |             |               |              |          |
| 1(c)      | same volume of apple juice ;<br>same volume / concentration of Benedict's solution / excess Benedict's ;<br>same temperature / same time ;<br>yellow/green = less (concentrated) / orange/red = more (concentrated) ;  | <b>max 3</b>  |                   |             |             |        |                                |             |                   |          |             |             |                   |           |             |               |              |          |
| 1(d)      | (dissolve in) ethanol ;<br>(add) water ;<br>cloudy / emulsion ;  | <b>3</b>      |                   |             |             |        |                                |             |                   |          |             |             |                   |           |             |               |              |          |

| <b>Question</b> | <b>Answer</b>   | <b>Marks</b> |
|-----------------|---|--------------|
| 2(a)            | (solution <b>H</b> could be) barium nitrate (or) silver nitrate ;<br>(solution <b>J</b> could be) ammonia (or) sodium hydroxide ;   | <b>2</b>     |
| 2(b)(i)         | add <b>excess</b> copper oxide to sulfuric acid in a beaker (and stir) ;<br>warm ;<br>filter / filtrate is copper sulfate solution ;  | <b>3</b>     |
| 2(b)(ii)        | <b>H</b> is barium nitrate (solution) ;<br><b>J</b> is ammonia (solution) ;   | <b>2</b>     |
| 2(c)            | (iron(III) sulfate) gives same result / brown ppt. with both sodium hydroxide and ammonia ;<br>so does not test/distinguish between sodium hydroxide and ammonia ;<br>it would identify barium nitrate/ <b>H</b> / still gives white ppt. with <b>H</b> ; | <b>3</b>     |

| Question | Answer  | Marks        |
|----------|---|--------------|
| 3(a)     | 0.36 (V) ;  | <b>1</b>     |
| 3(b)(i)  | 2.00 ;<br>6.78 ;  | <b>2</b>     |
| 3(b)(ii) | choice of scales and linear ( $\geq \frac{1}{2}$ the grid used) ;<br>plots correct to $\frac{1}{2}$ small square ;<br>good best-fit straight line judgement ;   | <b>3</b>     |
| 3(c)(i)  | candidate's $R$ value at $l = 10$ cm ;  | <b>1</b>     |
| 3(c)(ii) | (directly) proportional (if through origin) ;   | <b>1</b>     |
| 3(d)     | reading meter scale ;<br>observe perpendicularly / repeat / digital meter ;<br><br><b>OR</b><br><br>measuring the length of wire ;<br>observe perpendicularly / repeat (for decreasing lengths of wire) ;<br><br><b>OR</b><br><br>wire gets hot / resistance changes ;<br>switch off between readings ; | <b>max 2</b> |

| <b>Question</b> | <b>Answer</b>  | <b>Marks</b> |
|-----------------|--|--------------|
| 4(a)            | wear gloves / safe disposal of needle / use sterilised/clean needle/equipment ;  | <b>1</b>     |
| 4(b)(i)         | line to a red blood cell and labelled ;<br>line to a platelet and labelled ;   | <b>2</b>     |
| 4(b)(ii)        | quality drawing more than half of box with nucleus ;<br>irregular cell (freehand) with nucleus – 3 lobes ;<br><br>two of:<br><br>nucleus labelled ;<br>cytoplasm labelled ;<br>(cell) membrane ; | <b>4</b>     |
| 4(c)(i)         | measurement 8(.0)/8.5/9(.0)/9.5/10(.0)mm ;   | <b>1</b>     |
| 4(c)(ii)        | measurement to the nearest 0.5 mm <b>AND</b> larger than (c)(i) ;  | <b>1</b>     |
| 4(c)(iii)       | magnification correctly calculated to the nearest whole number ;   | <b>1</b>     |

| <b>Question</b> | <b>Answer</b>  | <b>Marks</b> |
|-----------------|--|--------------|
| 5(a)            | label syringe/measuring cylinder/burette ;<br>drawing of gas syringe/burette/up-turned measuring cylinder <b>or</b> graduated test-tube filled with water and in water ; | <b>2</b>     |
| 5(b)            | 6, 13.5, 28, 54.5, 65 ;  | <b>1</b>     |
| 5(c)            | 2.5 <b>AND</b> largest volume of gas/most gas (collected in 2 minutes/same amount of time) ;   | <b>1</b>     |
| 5(d)(i)         | stop watch/clock ;   | <b>1</b>     |
| 5(d)(ii)        | pipette/burette ;  | <b>1</b>     |
| 5(e)(i)         | temperature ;  | <b>1</b>     |
| 5(e)(ii)        | reliability / to take an average / spot anomalies ;  | <b>1</b>     |
| 5(f)            | CO <sub>2</sub> ;<br>turns limewater milky ;   | <b>2</b>     |

| <b>Question</b> | <b>Answer</b>  | <b>Marks</b> |
|-----------------|--|--------------|
| 6(a)            | clamp/retort (stand) ;   | <b>1</b>     |
| 6(b)            | don't touch the (hot) lamp ;   | <b>1</b>     |
| 6(c)(i)         | two plots ;  | <b>1</b>     |
| 6(c)(ii)        | smooth curve (through most of the points) ;<br>not through anomalous point / not taking into account anomalous point ; | <b>2</b>     |
| 6(c)(iii)       | value from graph ;<br>line / marking on graph ;  | <b>2</b>     |
| 6(c)(iv)        | as height increases temperature decreases ;<br>non-linear / T becomes constant ;                                       | <b>2</b>     |
| 6(c)(v)         | no further decrease in temperature / temperature stayed the same / reached room temperature ;                          | <b>1</b>     |