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**PHYSICS**

**0625/51**

Paper 5 Practical

**October/November 2017**

MARK SCHEME

Maximum Mark: 40

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**Published**

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This document consists of **5** printed pages.

| Question  | Answer                                                     | Marks |
|-----------|------------------------------------------------------------|-------|
| 1(a)      | $a = 19 - 21$                                              | 1     |
| 1(b)(i)   | Q values 1.(0), 2.(0), 3.(0), 4.(0), 5.(0)                 | 1     |
| 1(b)(ii)  | b values all less than 50 cm and decreasing                | 1     |
| 1(b)(iii) | Correct 1 / Q values 1.(0), 0.5(0), 0.33(3), 0.25, 0.2(0)  | 1     |
| 1(c)      | Graph:                                                     |       |
|           | Axes correctly labelled                                    | 1     |
|           | Suitable scales                                            | 1     |
|           | All plots correct to $\frac{1}{2}$ small square            | 1     |
|           | Good line judgement, thin, continuous line                 | 1     |
| 1(d)      | Triangle method clearly shown on graph                     | 1     |
|           | At least half line used for triangle method and G recorded | 1     |
| 1(e)      | P correct calculation of $G/a$ and in range 1.8 – 2.0      | 1     |

| Question     | Answer                                                                                                                                 | Marks |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------|-------|
| 2(a)(i)      | $V$ to at least 1 dp and $< 3\text{ V}$                                                                                                | 1     |
|              | $I$ to at least 2dp and $< 1\text{ A}$                                                                                                 | 1     |
| 2(a)(ii)     | $R_1$ correct                                                                                                                          | 1     |
| 2(b)(i),(ii) | New values of $V$ and $I$ and $R_2$ correct<br>AND<br>$2 \times R_1 \pm 10\%$                                                          | 1     |
| 2(c)(i)      | New values of $V$ and $I$ with $I_3 < I_2$                                                                                             | 1     |
| 2(c)(ii)     | $R_3$ present and $V, I, R$ units seen at least once and not contradicted                                                              | 1     |
| 2(d)         | Statement to match readings<br>AND<br>Justification to include the idea of within (or beyond, ecf) the limits of experimental accuracy | 1     |
| 2(e)         | Determine each resistance in turn                                                                                                      | 1     |
| 2(f)         | Three resistors in parallel, voltmeter in parallel with resistors and correct symbols for voltmeter and resistors                      | 1     |
|              | Variable resistor in series, correct symbol in a workable circuit                                                                      | 1     |
| 2(g)         | Repeat with different currents                                                                                                         | 1     |

| Question     | Answer                                                                                                                                                                                                                      | Marks |
|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 3(a)         | Table:                                                                                                                                                                                                                      |       |
|              | $v =$ in range 45 – 80                                                                                                                                                                                                      | 1     |
|              | $uv$ correct                                                                                                                                                                                                                | 1     |
|              | $D = u + v \pm 1 \text{ cm}$                                                                                                                                                                                                | 1     |
| 3(b)         | $v =$ in range 25 – 35                                                                                                                                                                                                      | 1     |
|              | $D = u + v \pm 1 \text{ cm}$                                                                                                                                                                                                | 1     |
| 3(c)         | One from:<br>Different size / Different brightness<br>Sharpness / clearness / coloured edges                                                                                                                                | 1     |
| 3(d)(i),(ii) | $f$ values both rounding to 14 – 16 (cm)                                                                                                                                                                                    | 1     |
| 3(d)(iii)    | $f_A$ correct                                                                                                                                                                                                               | 1     |
|              | 2 or 3 significant figures                                                                                                                                                                                                  | 1     |
| 3(e)         | Any <b>two</b> from:<br>Difficulty deciding exact position of sharpest image<br>Difficulty measuring to centre of lens<br>Product $uv$ increases problem<br>Image edges blurred / not clear<br>Insufficient sets of results | 2     |

| Question | Answer                                                                                                                                                          | Marks |
|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 4        | <b>MP1</b> Stopwatch (or equivalent) AND (metre) rule / ruler                                                                                                   | 1     |
|          | <b>MP2</b> Measure time for 5 (+) oscillations                                                                                                                  | 1     |
|          | <b>MP3</b> Divide by number of oscillations to find period ( $T$ )                                                                                              | 1     |
|          | <b>MP4</b> Repeat for each bob                                                                                                                                  | 1     |
|          | <b>MP5</b> Variable; <b>one</b> from:<br>Initial amplitude / starting position<br>Length of pendulum / thread<br>Number of oscillations                         | 1     |
|          | <b>MP6</b> Table with column headings for $t$ , or period ( $T$ ), or both AND $d$ , with correct units                                                         | 1     |
|          | <b>MP7</b> Conclusion:<br>Plot graph(s) of $d$ against period ( $T$ ) or $t$ (or vice versa)<br>OR compare period ( $T$ ) or $t$ values for different diameters | 1     |