



Cambridge International Examinations
Cambridge Ordinary Level

PHYSICS

5054/32

Paper 3 Practical Test

October/November 2016

MARK SCHEME

Maximum Mark: 30

Published

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- 1 (a) t in the range 0 (mm) to 4 (mm) B1
- (b) (i) sensible value of D . Repeats shown and correctly averaged, measured to the nearest mm or better B1
- (ii) clear description **or** clear diagram of how values of D obtained accurately. B1
- eye vertically above edge of lens on scale /
set square used against edge of lens, resting on scale /
measurements in two different orientations shown.
- (c) (i) diagram showing set square on each side of the lens
(like the jaws of vernier callipers)
- (ii) **and** sensible T in the range $t < T \leq 10$ mm B1
- (d) correct calculation of f giving an answer in the range 7.5 cm to 30.0 cm with consistent unit with elsewhere in (a), (b)(i) or (c)(ii). (Ignore s.f.) B1 [5]
- 2 (a) decreases *owtte* B1
- (b)(i)(ii) $T_1 = \text{their } t_1 / 10$ B1
- T_1 given to 2/3 s.f. Correct unit seen in (b) or (c) B1
- (c) $t_2 > t_1$ B1
- (d) T_2 / T_1 in the range 1.0 to 1.2 when rounded (ignore unit) B1 [5]
- 3 (a) V_1 in the range 1.8 V to 2.8 V to 0.1 V or better with unit seen here or in (b). **and** I_1 in the range 0.18 A to 0.28 A to 0.01 A or better with unit seen here or in (b) B1
- (b) $V_2 > V_1$ and in the range 2.4 V to 4.0 V to 0.1 V or better with unit seen here or in (a) **and** $I_2 < I_1$ and in the range 0.10 A to 0.20 A to 0.01 A or better with unit seen here or in (a). B1
- (c) (increasing the resistance) reduces the current which increases the voltmeter reading or vice versa B1
- (d) correct calculation of R from their (a) and (b) B1
- note – B0 if sign error in calculation
- R in the range 6.0Ω to 20.0Ω to 2/3 s.f. and unit B1 [5]

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4 Preliminary results

- (a) y measured to the nearest mm or better and in the range 1.5 cm to 3.0 cm with consistent unit seen here or in (b) B1
- (b) (i) x in the range 39.6 cm to 40.4 cm to nearest mm or better and with consistent unit seen here or in (a) or (b)(ii) B1
- (ii) correct determination of e in the range 9 cm to 14 cm with unit seen here or in (a) or (b)(i) B1
- (iii) diagram **or** explanation
measured the height of the metre rule above the bench in at least 2 places (and found to be equal) / Horizontal alignment with window sill / top of door etc. B1 [4]

Table

- (c) column headings with units for x , L and e and results from (b) included B1
- correct calculation of e B1
- Δx values ≥ 50 cm B1
- at least 5 results showing correct trend, e increases as x increases B1 [4]

Graph

- (d) axes labelled with units and correct orientation B1
(allow e.c.f. from wrong unit in table but not no units)
- suitable scale, not based on 3, 6, 7 etc. with plotted data occupying $\geq$ half the page in both directions B1
- two points plotted correctly – check the two points furthest from the line. This mark can only be scored if the scale is easy to follow B1
(points must be within $\frac{1}{2}$ small square of the correct position)
- best-fit fine straight line and fine points or crosses B1 [4]
(line thickness to be no greater than the thickest lines on the grid)

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Calculations

- (e) correct readings used for a pair of points on the line used for the gradient determination
(triangle seen or implied) B1
- more than half the drawn line used for points B1
- correct calculation of gradient in the range 0.2 to 0.3 when rounded
(ignore unit) B1 [3]