

**MARK SCHEME for the May/June 2010 question paper
for the guidance of teachers**

0625 PHYSICS

0625/63

Paper 63 (Practical), maximum raw mark 40

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.

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- 1 (a) table:
 $1/d$ values correct
 0.0331, 0.0418, 0.0500, 0.0585 (0.058 to 2 sig. fig.), 0.0662
 consistent 2 or 3 significant figures
- (b) graph:
 axes labelled [1]
 scales suitable, plots occupying at least half grid [1]
 plots all correct to $\frac{1}{2}$ square (ecf) – take centre of plot if large [1]
 well judged line thin line ($\leq \frac{1}{2}$ square) [1]
 (no mark if plots $> \frac{1}{2}$ square)
- (c) triangle method used and shown (any indication on graph) [1]
 (triangle) using at least half line (can be seen in calculation) [1]
- (d) μ 27 – 33 (NO ecf) [1]
 2 or 3 significant figures and unit g [1]
- [Total: 10]**

- 2 (a) table:
 t in s, θ in $^{\circ}\text{C}$ (either in words or mixture of symbols and words)
 (NOT degrees/centigrade) [1]
 times 30, 60, 90, 120, 150, 180 [1]
- (b) both temperature falls correct (ignore unit or lack of unit) 26, 30 [1]
- (c) justification matches statement (expect B)
 and by reference to readings (need a comparison – not 'heat' or 'it')
 B & temp fall [1]
 in same time [1]
- (d) any two from:
 same starting temperature
 stir/same thermometer position
 same interval time
 constant room temperature/carry out at same time
 same volume/amount/mass of water
 avoid draughts or wtte [2]
 (NOT reference to container, insulation, precaution)
 (extra answers: –1 if incorrect, ignore if neutral)
- [Total: 7]**

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- 3 (a) diagram:
 correct symbols for ammeter, voltmeter and lamps
 (lamp – cross at least ½ diameter by eye) (ignore power source)
 voltmeter position correct [1]
 lamps in parallel in a correct circuit (e.g. single voltmeter) [1]
- (b) table:
 V, A, Ω (any in symbols, words or a mixture) [1]
 Correct R values 6.13, 6.00, 3.11 [1]
 Consistent 2 or 3 significant figures [1]
- (c) statement matches readings (expect NO) [1]
 justification matches statement [1]
 and by reference to resistance results (don't need numbers) [1]

[Total: 8]

- 4 (a) normal labelled (allow N N' on end or N, N' alone) [1]
- (b) P₁P₂ distance at least 3 cm [1]
- (c) line to H drawn neatly and correctly [1]
 θ correct to $\pm 1^\circ$ 60 [1]
 ($\theta - 2i$) correct 0 (ecf) (ignore sign) [1]
 unit $^\circ$ at least once in (c) and not contradicted [1]
- (d) 2° (ignore unit and sign) [1]
- (e) statement matches results (ecf)
 expect YES if 0 and 2,
 NO only if 'too different' or wtte in justification [1]
 justification matches statement and by reference to results [1]
 (allow almost/nearly the same or within expt accuracy) [1]

[Total: 9]

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- 5 (a) $x = 3.9$ and $y = 5.4$ (any answer correct when rounded to 2 sf)
both with correct unit
 $m = 1.38$ no unit, 2 or 3 significant figures (allow x for unit)
or correct calculation from correct x and y
- (b) any two from:
clamp rule or place on bench
use area away from direct sunlight/dark room/bright object
ensure object and lens same height (from bench)
mark on lens holder (accept on lens)
screen and lens perpendicular to bench/aligned/in straight line/on principle axis
move lens slowly (backwards and forwards)
repeats
avoid parallax (or wtte) with action given 2
- (c) scale drawn on paper on screen/graph paper on screen/
mark on screen (then) measure/clamp ruler on scale/
use translucent screen and measure from other side [1]

[Total: 6]