

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

**MARK SCHEME for the October/November 2011 question paper
for the guidance of teachers**

5054 PHYSICS

5054/31

Paper 3 (Practical Test), maximum raw mark 30

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- 1 (b) Measured the height of the string above the bench at 2 places/
Used set square to check angle MBC/
Aligned with horizontal surface in room, e.g. bench. B1 [1]
- (c) l in range 24.0 cm to 26.0 cm and $l > h_1 - h_2$ with correct unit seen somewhere. B1
All lengths recorded to the nearest mm or better. B1 [2]
- (d) Correct calculation of $\sin \theta$ and θ giving a value of θ in the range 40° to 80° . C1
 θ in the range 50° to 70° with unit. A1 [2]
- [Total: 5]
- 2 (a) (ii) Expect value in range 12.0 s to 16.0 s, otherwise allow value within 2.0 s of Supervisor's value, with t_1 repeated and averaged. Allow nearest second. B1 [1]
- (iii) Correct calculation of T_1 to 2/3 s.f. and unit seen somewhere in (a). B1 [1]
- (b) Two values of t_2 , T_2 found correctly and $T_2 > T_1$ with 2/3 s.f. and unit. B1 [1]
(In (a) and (b), penalise significant figures once only and penalise units once only.)
- (c) Correct calculation of ratio of periods with value in the range 1.10 to 1.50. M1
(Allow 0.67 to 0.90 if f calculated in (a) and (b).)
(Also allow t_2/t_1 .)
Ratio in range 1.20 to 1.40 with no unit (or 0.71 to 0.83 if f used). A1 [2]
- [Total: 5]
- 3 (b) u in the range 16.0 cm to 21.0 cm and $u + v = 100.0 \pm 1.0$ cm. M1
Ignore precision and unit. A1 [2]
At least one measurements recorded to the nearest mm or $\frac{1}{2}$ mm with unit.
- (c) (i) d found correctly from more than one gap and in the range 6.0 mm to 13.0 mm. Allow repeat measurements of one gap, but must see evidence of repeats. B1 [1]
- (ii) A minimum of 3 spacings used to find d . This may be shown on a diagram or stated in the results. B1 [1]
- (d) s in the range 1.3 mm to 3.0 mm from correct calculation, with unit seen here or in (c)(i). B1 [1]
- [Total: 5]

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4 Preliminary Results

- (a) Circuit diagram showing:
 Series circuit with power supply (allow d.c or a.c), two resistors, (switch) and ammeter. B1
 Voltmeter in parallel with power supply and one resistor. B1 [2]
 Voltmeter in series loses both marks.
- (b) V in the range 0.7V to 1.7V measured to 0.1V or better with unit. B1
 I in the range 0.050A to 0.110A measured to the nearest 0.01A or better with unit. B1 [2]

Table

- (c) Table with units for resistance, V and I . B1
 Minimum of 3 readings for V with correct trend for all readings i.e. as R increases V increases. M1
 Minimum of 3 readings for I with correct trend for all readings i.e. as R increases I decreases. M1
 7 values in total. A1 [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 data occupying more than half the page in both directions. B1
 Two points plotted correctly – check the two points furthest from the line. B1
 This mark can only be scored if the scale is easy to follow.
 (Points must be within $\frac{1}{2}$ small square of the correct position)
 Best fit fine line and fine points or crosses. B1 [4]
 (Line thickness to be no greater than the thickest lines on the grid)

Calculations

- (e) Use of a triangle that occupies more than half the drawn line. B1
 (Not using points that are not on the line or points that are on a curve.)
 Correct calculation 2/3 s.f. (ignore absence of unit). B1
 Gradient in range 26 to 40 (Ω or V/A) from correct calculation with consistent sign (expect negative sign). B1 [3]
 (Allow -0.026 to -0.040 if I axis in mA.)

[Total: 15]