MARK SCHEME for the May/June 2011 question paper

for the guidance of teachers

5054 PHYSICS

5054/32   Paper 3 (Practical Test), maximum raw mark 30

1 (a) *d* in the range 48.0 cm to 52.0 cm, recorded to the nearest mm or better with unit. B1 [1]

(c) Align PQ to vertical string to which mass is attached/align PQ with window frame or other vertical line in room/measure two horizontal distances from vertical half-metre rule (checked with set square at bench). B1 [1]

(d) *x* should be 0.9 cm to 1.1 cm less than *d.* B1

x and *y* measured to the nearest mm with unit seen in **(i)** or **(ii)** and *y* sensible (55.0 cm to 80.0 cm). B1 [2]

(e) Correct calculation of *M* with unit from sensible values of *x* and *y*. (Ignore s.f.) B1 [1]

[Total: 5]

2 (a) *l* in range 79.5 cm to 80.5 cm, recorded to the nearest mm with unit. B1 [1]

(b) (i) *t* repeated or at least 40 oscillations timed and average value in range 34.5 s to 37.3 s. B1 [1]

(ii) *T* in range 1.75 s to 1.85 s obtained from 20 *T*.
(Unit seen in **(i)** or **(ii)** else – 1) B1 [1]

(c) Correct calculation of *g* from sensible data giving a number in the range 9.0 to 11.0 or 900 to 1100. M1

Correct unit (Ignore s.f.). A1 [2]

[Total: 5]

3 (a) Correct normal and angle of incidence = 60° by eye. B1 [1]

(b) Centre of straight edge at M, lines drawn to represent the outline of block and correct construction inside block with angle of reflection in the range 58° to 62° with correct unit and from correct diagram. B1

P_1 and P_2 labelled with one mark within 2.0 cm of the block and the other mark within 1.0 cm of the line indicating the margin. B1 [2]

(c) P_3 and P_4 labelled on the incident ray and in approximately the correct position. B1

Angle of incidence within the block found to be in the range 38° to 43° from a correct diagram. B1 [2]

[Total: 5]

4   Preliminary Results

(a) Circuit diagram showing:
power supply, LED (accept LED or diode symbol, ignore polarity), resistor (X),
resistor or gap (between A and B), ammeter and voltmeter in parallel with LED.
(ignore switch)   B2   [2]
(–1 for each error in the diagram)

(b) V in the range 1.5 V to 2.5 V measured to 0.1 V or better with unit.   B1

I in the range 5.0 mA to 25.0 mA measured to the nearest 0.1 mA or better with
unit.   B1   [2]

(c) Correct calculation of power with unit consistent with I and V.   B1   [1]

Table

(d) Table with units for resistance, V, I, and power.   B1

In awarding the next marks good results should be judged by checking that I
decreases as R increases. Note that a straight line on the graph will not
necessarily indicate good results.

3 good values for I.   B1

4th good value for I.   B1

5th & 6th good values for I.   B1

7th good value for I B1   [5]

Graph

(e) 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
(Allow the graph to start at the origin.)

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 ½ 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

(f) Value of power, correctly read off at 10 mA with unit.   B1   [1]

[Total: 15]

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