CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

MARK SCHEME for the October/November 2014 series

0625 PHYSICS

0625/63 Paper 6 (Alternative to Practical), maximum raw mark 40

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1 **(a)** h_0 present and H_0 = 84(.0) (cm) [1]

(b) suitable explanation,
e.g. same no. of graduations between 60 cm mark and each end of mass owtte,
or mark on <u>side</u> of rule and mass [1]

(c)(d) h present and H = 83(.0) [1]

D = 1(.0) and $d \times D$ calculations correct: 60, 75, 100, 111, 100 [1]

(e) $d \times D$ not constant / D doesn't always double when d halves owtte [1]

(f) **(i)** reference to mass/weight of rule [1]

(ii) measure height at bench [1]

subtract H_0 [1]

[Total: 8]

2 **(a)** θ for **A** 76 (°C) <u>and</u> for **B** 79 (°C) [1]

(b) units all correct [1]

t values correct 0, 30, 60, 90, 120, 150, 180 [1]

(c) statement matching temperature changes <u>with</u> justification referring to results <u>and</u> involving correct comparative change in temperature [1]

justification has specific mention of temperature change <u>in the same time</u> owtte [1]

(d) appropriate source of inaccuracy <u>associated with procedure</u> e.g. any one from:
- water levels not the same
- thermometer scales not read at 90°
- initial temperatures different
- not able to stir water
- not waiting for temperature to stabilise initially / waiting time not long enough [1]

(e) any two factors relating to <u>apparatus</u> from:
- keep thermometer at same depth
- same size/thickness/material of test-tube / same test-tube
- same water levels/volume/quantity/amount of water
- same thickness/surface area of surface material [2]

[Total: 8]

3 **(a)** h_o = 2.0 (cm) [1]

(b)(c) h_I = 1.9 (cm) [1]

S values round to 1.1 (allow ecf), 1.3, 1.7, 2(.0), 2.2, 2.5 [1]

(d) graph:
axes labelled with quantity and unit and in correct orientation [1]
appropriate scales [1]
plots correct to ½ small square [1]
well-judged straight line and thin continuous line, precise plots [1]
triangle method/information for gradient seen marked on graph [1]

(e) **(i)** *G* calculated from at least ½ line [1]

(ii) *f* in range 15 – 19 (cm) [1]

[Total: 10]

4 **(a)** **(i)** (as θ increases) *d* increases (to a maximum at 40° / between 40° and 50° / between 30° and 40°) then decreases [1]

(ii) both in range 15 to 35 (cm) [1]

(b) any suitable means of detecting *d* more easily, e.g. any one from:
- sand tray
- use of carbon paper
- ink on ball
- fixing rule to floor
- use of video
- reference to releasing ball remotely
- mark approximate point and repeat to confirm [1]

(c) repeats owtte [1]

qualification or detail regarding repeats, e.g. repeat at each value of θ / repeat and take an average / take more sets of readings / repeat for θ values between those given in table [1]

[Total: 5]

5 **(a)** voltmeter in parallel with lamp **L** and with correct symbol [1]

(b)(c) table:
V = 1.7 (V) [1]
I = 0.18 (A) [1]
R = 9.4(4) ecf **(b)**, 7.6 / 7.58 with 2 or 3 sig. figs. [1]
all units correct (V, A, Ω) [1]

(d) statement matches results, with matching justification which refers to values being 'too different' / 'difference beyond limits of experimental accuracy' owtte [1]

(e) lamp in circuit 1 brighter than in circuit 2
and has greater resistance [1]

(f) correct circuit symbol for variable resistor (rectangle with strike-through arrow only) [1]

connected in correct series circuit [1]

[Total: 9]