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**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 side 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)** $\theta$ for **A** 76 (°C) and 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 with justification referring to results and involving correct comparative change in temperature [1]

justification has specific mention of temperature change in the same time owtte [1]

**(d)** appropriate source of inaccuracy associated with procedure 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 apparatus 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]**

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**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 $\theta$ 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 $\theta$ / repeat and take an average / take more sets of readings / repeat for $\theta$ values between those given in table [1]

**[Total: 5]**

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**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]**

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