**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**International General Certificate of Secondary Education**

# MARK SCHEME for the May/June 2014 series

## 0625 PHYSICS

**0625/61** Paper 6 (Alternative to 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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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**1** **(a) (b)** 21 (mm) [1]

210 (mm) ecf from $l_0$ [1]

**(b)** 45 (mm) and
0.067 or 0.0667 (N / mm), 2 or 3 sig. figs.
ecf from $l_0$ and $L_0$ [1]

correct unit N / mm or N / m or N / cm as appropriate [1]

**(c)** $T$ = 1.342 (s) or 1.34 (s) [1]

**(d)** $T$ = 1.724 s (no mark)
statement NO (ecf from **(c)**) [1]

difference too large (for experimental inaccuracy) (ecf) [1]

**(e)** clear diagram or explanation that indicates:
perpendicular viewing of spring or scale
OR appropriate use of horizontal pointer / set square / rule, etc.
OR rule touching / very close to spring [1]

**[Total: 8]**

**2** **(a)** stopwatch / stopclock [1]

**(b)** any three from:
- length of rod
- diameter / thickness / area (of cross-section) of rod
- amount of wax / type of wax
- weight / size/mass of marker
- position for the markers
- (Bunsen) flame / (rate of) heating
- position of Bunsen / flame
- position of rod on tripod [max 3]

**(c)** temperature too high
or thermometer only measures up to about 100 °C
or small range [1]

thermometer / bulb can't make proper contact [1]

**[Total: 6]**

**3** **(a)** $\theta_H$ = 92 (°C) [1]

**(b)** **(i)** table: s, °C, °C [1]

**(ii)** decreases [1]

justified by reference to results, giving numbers referring to temperature drops [1]

**(c)** any two from:
- room temperature / air conditioning / draughts / environmental conditions
- starting temperature (of thermometer) / temperature of (hot) water
- density of packing / amount of cotton wool / dryness of cotton wool [max 2]

**[Total: 6]**

**4** **(a)** **(i)** 1.9 (V) [1]

0.26 (A) [1]

**(ii)** $R$ = 7.3 (7.3077) (Ω) accept any sig. figs. > 2, ecf allowed [1]

all units V, A, Ω correct, symbols or words [1]

**(b)** brightness increases (from X to Z) [1]

**(c)** one from:
- exact placement of S
- width of S
- battery running down / voltage changed
- wire/lamp getting hot
- resistance of lamp / wire changed [max 1]

**(d)** increases (note: if this mark is not scored, the next mark cannot be scored) [1]

$V$ increases more quickly than $I$ (accept greater rate)
or $V$ increases proportionately more than $I$
or doubling $V$ causes $I$ to increase by less than double
allow gradient is increasing [1]

**[Total: 8]**

**5** **(a)** angle of incidence 30° and **AB** 8.0 cm single, continuous, straight line [1]

**(b)** $P_3P_4$ line correct and neat [1]

$\alpha_o = 30 \pm 1^o$ [1]

**(c)** **graph:**
axes correctly labelled and correct way round [1]

suitable scales, i.e. *y*-axis 2 cm = 20°, *x*-axis 2 cm = 10° [1]

all plots correct to ½ small square [1]

good line judgement [1]

single, thin, continuous line, neat points [1]

**(d)** triangle method seen on graph with triangle using at least half of line [1]

*G* between 1.9 and 2.1, ecf for axes wrong way round [1]

**(e)** $(\alpha - \alpha_o) = 2\theta$ or words to that effect, no ecf [1]

**(f)** any one from:
large(r) pin separation
view bases of pins (or ensure pins vertical)
repeat and average
thin(ner) pins
thin(ner) lines / sharp(er) pencil [max 1]

**[Total: 12]**