

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge Ordinary Level

MARK SCHEME for the October/November 2014 series

5054 PHYSICS

5054/41

Paper 4 (Alternative to Practical), maximum raw mark 30

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- 1 (a) any **one** from:
 measures two ends of ruler from the bench (same height) B1 [1]
 use of spirit level
 align with horizontal object e.g. windowsill
 allow answers on diagram e.g. ruler and set-square to measure height at two places
 check the strings are perpendicular to the metre rule with a set square
- (b) (i) at least one horizontal line drawn between A and B and x accurately labelled B1
 (ii) measure from bench/support to same point on each bob/ensure the pendulum is not moving/explain how parallax error is avoided. B1 [2]
- (c) axes labelled quantity and unit B1
 scales linear B1
 points plotted accurately B1
 best fit curve drawn B1 [4]
- (d) (i) observe both together/observe simultaneously B1
 (ii) any **one** from:
 strings tangle B1 [2]
 bobs collide
- (e) (i) 15 ± 1 ecf from graph B1
 (ii) 15.484 C1
 15 A1
 (iii) If both values are the same – Yes, they are the same.
 If values are similar ($\pm 10\%$) – Yes + close enough /within experimental error B1 [4]
 If values differ (by more than 10%) – No + difference outside experimental error / they are too far apart
- [Total: 13]
- 2 (a) metre rule B1 [1]
- (b) (i) error in taking measurement due to position of observer B1
 (ii) view from level with top of stool B1 [2]
- (c) (i) metre rule upside down B1
 (ii) 62.175 or 62.18 or 62.17 or 62.22 seen C1
 62.2 cm cao A1 [3]
- [Total: 6]

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3 (a) place bulb in (pure) melting ice B1
 place bulb above boiling water/in steam B1 [2]

(b) (i) 2.85 ± 0.1 and 12.1 ± 0.1 seen OR 1, 3.8 and 13 OR 2, 4.8 and 14 (all ± 0.1)
 answer in correct range without unit C1
 answers in range 22.5 to 24.6 °C with unit A1

(ii) liquid expands uniformly/uniform bore B1 [3]

[Total: 5]

4 (a) Two methods can gain up to 5 marks.

1. cut wires method and line up horizontally (max 3 if less than 10 cuts)
2. wrap wire around a rod/ruler (max 3 if wound less than 10 times)

any other method – maximum 3 marks if viable

equipment used stated in account B1
 how equipment is used B1
 readings taken stated B1
 how diameter is obtained B1
 detail of accuracy B1 [5]

(b) micrometer B1 [1]

[Total: 6]