

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

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) 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]