

CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

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MARK SCHEME for the October/November 2012 series

5054 PHYSICS

5054/42

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

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

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Page 2	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – October/November 2012	5054	42

- 1 (a) time (for one length) is small/
reaction error large (compared with time)/
gives average B1 [1]
- (b) (i) distance (travelled by wave) / length of tray varies/
cannot place rule close to water B1 [1]
- (ii) clear sensible description, e.g.
ruler viewed from vertically above / perpendicularly
use tape measure (flexible)
answers may be on diagram, e.g.
ruler and eye above
ruler and set squares B1 [1]
- (c) (i) zero error / dead space at end of ruler/
zero on ruler not at end/base of tray B1 [1]
- (ii) use second ruler to measure length of dead space
length of dead space added to ruler reading (of depth) B1
B1 [2]
- (d) (i) axes: correct way round, labelled quantity and unit B1
- scales: more than $\frac{1}{2}$ grid, linear, not awkward
e.g. x-axis: 2 cm \equiv 0.5 cm y-axis: 2 cm \equiv 5 cm/s B1
- points plotted accurately within $\frac{1}{2}$ small square
neat crosses or small points (in circle) B1
- smooth curve of best fit drawn B1 [4]
- (ii) tray not deep enough/
water spills out (when wave made)/
time too small / wave travels too fast B1 [1]
- (iii) speed becomes constant / does not vary (with d)/
increase in speed becomes smaller (with increasing d)/
gradient decreases (with increasing d) B1 [1]
- [Total: 12]**

Page 3	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – October/November 2012	5054	42

- 2 (a) 2755 used correctly or 34 seen
4861.8... (any number of sf)
81 or 81.0 or 5290 or 5300
4860 / 4900 unit not required
- C1
C1
A1 [3]
- (b) (i) uniform temperature / heat distribution
- B1 [1]
- (ii) base kettle hotter than water
- B1 [1]
- (c) heat losses to kettle / surroundings / to evaporate water
power too large/
time too large/
mass too small/
temperature difference too small
- B1 [1]
- [Total: 6]**
- 3 (a) table headings correct: m and t
both units: g and s
- B1
B1
- mass values correct in order (up or down)
- B1 [3]
- (b) (i) NO +
within experimental error / readings very close / no pattern
- B1 [1]
- (ii) check (at least) one reading (to check random/operator error)/
time more swings/
extend range of values of m /
take intermediate values/
repeat **experiment** with different length string
- B1 [1]
- [Total: 5]**

Page 4	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – October/November 2012	5054	42

- 4 (a) (i) line correctly drawn through P_1 and P_2 and extended into prism B1 [1]
- (ii) line correctly drawn through P_3 and P_4 and extended back to cross (a)(i) B1 [1]
- (iii) correct construction lines **and** $36^\circ \pm 2^\circ$ B1 [1]
- (iv) path through prism correctly drawn B1 [1]
- (b) spectrum formed/
dispersion occurs/
splits into colours B1 [1]
- (c) (i) not perpendicular/at 90° to surface/prism/side of prism
normal is perpendicular to surface B1 [1]
- (ii) correct normal seen and $32^\circ \pm 2^\circ$ B1 [1]

[Total: 7]