

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
GCE Ordinary Level

MARK SCHEME for the May/June 2008 question paper

5054 PHYSICS

5054/04

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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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Page 2	Mark Scheme	Syllabus	Paper
	GCE O LEVEL – May/June 2008	5054	04

- 1 (a) bottom/lowest part [1]
- (b) (i) ball drawn at 0.66 m on ruler by eye
OR ecf (a) allow radius/diameter as centre of ball (1)
- (ii) eye marked level with ball looking toward ball and ruler ecf (b)(i) (1) [2]
NOT eye between ruler and ball
- (c) (i) cannot view drop position and bounce height at same time/
reference to speed changing or short time ball at highest point/
parallax error due to distance between ball and ruler [1]
- (ii) one drops ball, other measures height (from correct level) [1]
ignore repeat and average
allow throw for dropping
NOT both read height then find average
NOT measuring time/use a stopwatch
- (d) (i) 0.83 cao [1]
- (ii) 0.68 to 0.70 (without checking working) ignore sf and rounding errors allow 0.7
ecf (d)(i) (check working) [1]
- (e) axes: quantity and unit labelled and both correct way round (1)

scales: more than $\frac{1}{2}$ page, sensible, from (0,0) (1)
allow 2 cm = 0.2 m or 0.25 m and 2 cm = 1 bounce

points plotted accurately within $\frac{1}{2}$ square (1)

best fit curve drawn, neatly (1) [4]
- (f) N increases h decreases/inverse relationship [1]
allow inversely proportional/negative correlation
- (g) whole number in range 7 to 15 [1]
allow e.g. 7.0

[Total: 13]

Page 3	Mark Scheme	Syllabus	Paper
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- 2 (a) diagram of cell and voltmeter (and bulb) with voltmeter across cell or bulb (1)
 allow: incomplete circuit, line through voltmeter symbol
 allow other components if voltmeter across cell only
 ignore: switches, open or closed
 NOT cell short-circuited
- reading on voltmeter much less than 1.5 V (allow value if less than 1 V) (1) [2]
 allow: voltmeter reads zero/no deflection on voltmeter
 ignore: voltmeter would not work/check whether deflection or not/V across cell should be 1.5 V
- (b) **any three** comments from:
 mark each answer space separately, list rule applies
- bulb broken/blown
 allow: bulb fused/lamp out of order
 - bulb not connected/not screwed in
 - faulty switch
 allow: switch might not be closed
 ignore switch is open
 - faulty connecting lead
 ignore wire missing
 - detail of bad connection
 - bulb rating incorrect (higher than 1.5 V) [3]
 ignore lamp needs more volts to work/voltage of cell not enough to light bulb
- [Total: 5]**
- 3 (a) (i) tape measure/metre rule [1]
 ignore additional measuring instruments
 NOT inches tape
- (ii) length, width and height of room/dimensions of room [1]
 check diagram for annotation
 ignore additional quantities, e.g. mass, density
- (iii) $(V =) l \times w \times h$ equation or words/($V =$) area \times height [1]
- (b) **two** sensible comments, **e.g.**
 list rule applies
- parallax error (unqualified/in any measuring instrument)
 - zero error explained
 - cupboards/walls not flat/ceiling not flat
 allow any comments to cupboards/room contents
 - room not square
 - tape measure too short
 - ceiling too high to reach/hazard identified [2]
- [Total: 5]**

Page 4	Mark Scheme	Syllabus	Paper
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- 4 (a) 23 °C unit required
allow 23.0 °C
not C° [1]
- (b) (i) B (1)
- reads to 100 °C/110 °C/boiling point of water (1)
ignore wide range of temperature
- comparison with A; e.g. more sensitive/more divisions ignore just longer than A
OR scale reads to 1 °C/each division 1 °C (1) [3]
- (ii) any two good points, e.g.
1/3 length immersed
thermometer not touching container/in centre of water
ignore thermometer hung from string
water stirred (with stirrer, NOT thermometer unless A chosen in (b)(i))
reading taken with eye level with meniscus/avoid parallax error [2]
ignore incorrect parallax explanations
- NOT wait for meniscus/reading to become steady unless clearly initial rise
repeat readings
- (c) not breakable/not placed in mouth/more hygienic/safer [1]
allow children moving about/fidgeting
ignore easier to use/more accurate/no parallax error

[Total: 7]