

## MARK SCHEME for the May/June 2008 question paper

### 5054 PHYSICS

5054/04

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

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- 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]

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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]**