

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE O Level

**MARK SCHEME for the May/June 2006 question paper**

**5054 PHYSICS**

**5054/04**

**Paper 4**

**maximum raw mark 30**

This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which Examiners were initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

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.

Mark schemes must be read in conjunction with the question papers and the *Report on the Examination*.

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- 1 (a) (i) length clearly marked, from top or bottom of rings  
(ii) vertical ruler drawn within ½ cm of load  
(iii) eye/observer positioned to avoid parallax
- (b) values in table in ascending/descending order
- (c) axes: – correct way round, labelled quantity and unit  
scales: – more than ½ grid, sensible  
points: plotted accurately (within ½ square) and neat  
line: straight line best fit drawn with ruler, neat [4]
- (d) (i) spring has length with no load  
(ii) no line does not go through origin [2]
- (e) (i) increase in length  
(ii)  $20.5 \pm 0.5$  cm  
(iii) straight line through origin [4]
- [Total: 14]
- 2 (a) iron/soft iron/mumetal [1]
- (b) any suitable method which will give a comparison  
e.g. how many/mass paper clips/pins/nails/tacks holds,  
distance from paper clip to make paper clip move/jump  
distance from compass to make it move [1]
- (c) A: does not change circuit/current/resistance [1]
- [Total: 3]
- 3 (a) connects battery, bulb, component in series [1]
- (b) reverses connections in box/battery  
checks brightness [2]
- (c) no light  
bright both ways  
bright one way, off when connections reversed  
dim both ways [4]
- [Total: 7]
- 4 (a)  $0.8 \pm 0.1$  cm       $5.0 \pm 0.1$  cm [1]  
draw parallel tangents/measure more than one in different places [1]
- (b)  $7.85 \text{ cm}^3$  ecf (one, two or 3sf) [1]
- (c) thickest part in the centre/at distance from ruler/  
parallax error explained [1]
- (d) (i) displacement of water described,  
volume displaced equals volume of lens
- (ii) volume of water displaced small, needs large displacement can/  
measuring cylinder/large scale on measuring cylinder [2]
- [Total: 6]