

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

General Certificate of Education O Level

MARK SCHEME for the June 2005 question paper

5054 PHYSICS

5054/03

Paper 3 (Practical Test), maximum mark 30

These mark schemes are published as an aid to teachers and students, to indicate the requirements of the examination. They show the basis on which Examiners were initially instructed to award marks. They do 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*.

- CIE will not enter into discussion or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the June 2005 question papers for most IGCSE and GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

June 2005

GCE O Level

MARK SCHEME

MAXIMUM MARK: 30

SYLLABUS/COMPONENT: 5054/03

**PHYSICS
Paper 3 (Practical Test)**



| Page 1 | Mark Scheme | Syllabus | Paper |
|--------|-------------------------|----------|-------|
| | GCE O Level – June 2005 | 5054 | 3 |

| | | | |
|---|---------------|--|------------------|
| 1 | (a) | Sensible l (approximately 80 cm to 90 cm) with unit seen here or in part (b) | M1 |
| | (b) | Correct calculation of D giving sensible answer (approximately 7 cm) to 2/3 s.f. with unit seen here or in part (a) | A1 |
| | (c) | Sensible d (approximately 6 - 7 cm) and sensible h (approximately 10 cm) both recorded to the nearest mm with unit | B1 |
| | (d) | Sensible value for M (approximately 100 g) and correct substitution into the formula for density provided substitution leads to a non-negative value Density in range 0.5 to 5.0 g/cm ³ with unit. | M1 A1 [5] |
| 2 | (a) | Time recorded to the nearest second or better and in the region of 75 seconds with unit | B1 |
| | (b) | Time recorded to the nearest second or better and significantly smaller than the time in (a) with unit | B1 |
| | (c) | Precautions; Stirring the water before taking the reading Reading the thermometer with the eye level with the meniscus Bulb of the thermometer not touching the side or base of the beaker | B1 B1 |
| | (d) | (No e.c.f. to this choice). 250 cm ³ beaker cools more rapidly because; the same temperature fall occurs in a shorter time/ there is a greater surface area of water in contact with the air that allows more thermal energy to escape from the water/ the greater mass of the larger beaker absorbs more thermal energy | B1 [5] |
| 3 | (a), (b), (c) | Sensible I for $V = 6$ V and table with units All V sensible and correct to at least 2 s.f. All I sensible and correct to at least 2 s.f. Correct trend in R values. (R increases as V increases) | B1 B1 B1 |
| | (d) | Comment that R increases as V increases (no e.c.f.) | B1 [5] |

| Page 2 | Mark Scheme | Syllabus | Paper |
|--------|-------------------------|----------|-------|
| | GCE O Level – June 2005 | 5054 | 3 |

4 Initial Measurements

- (a) Sensible h (approx 5 cm) recorded to the nearest mm **B1**
Set square correctly placed between desk and rule or vertical rule and ball **B1**
- (b) 10 T repeated and averaged **B1**
Sensible T determined from 10 T with unit **B1 [4]**
(Not allow nearest second in 10 T)

Table

- (c) Table with units for h , 10 T , T and T^2 **B1**
 h varied over a range of at least 20 cm **B1**
At least 5 points with correct trend (T decreases as h increases) **B1**
- (d) Correct calculation of T^2 values to ≥ 3 s.f. **B1 [4]**

Graph

- (e) Axes labelled with units and correct orientation **B1**
(penalise if graph of T/s plotted against h/cm)
Suitable scale, not based on 3, 6, 7 etc. with data occupying more than half the page in both directions **B1**
Two points plotted correctly - check the two points furthest from the line. This mark can only be scored if the scale is easy to follow **B1**
Best fit line and fine points **B1 [4]**

Calculations

- (f) Use of large triangle with base ≥ 8 cm or height ≥ 12 cm **B1**
Correct reading of sides of triangle with straight hypotenuse **B1**
Negative sign and value in range 0.038 to 0.042 (s^2/cm) to ≥ 2 s.f. **B1 [3]**
(Allow 0.04 for 0.040 and ignore missing unit)