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**

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UNIVERSITY of CAMBRIDGE
International Examinations

June 2005

GCE O Level

MARK SCHEME

MAXIMUM MARK: 30

SYLLABUS/COMPONENT: 5054/03

PHYSICS
Paper 3 (Practical Test)

UNIVERSITY of CAMBRIDGE
International Examinations

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	**M1**	
		Density in range 0.5 to 5.0 g/cm^3 with unit.	**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	**B1**	
		Reading the thermometer with the eye level with the meniscus Bulb of the thermometer not touching the side or base of the beaker	**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	**B1**	
		All *V* sensible and correct to at least 2 s.f.	**B1**	
		All I sensible and correct to at least 2 s.f.	**B1**	
		Correct trend in *R* values. (*R* increases as *V* increases)	**B1**	
	(d)	Comment that *R* increases as *V* increases (no e.c.f.)	**B1**	**[5]**

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 (Not allow nearest second in 10 T)	**B1**	**[4]**

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 (penalise if graph of T/s plotted against h/cm)	**B1**	
	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. (Allow 0.04 for 0.040 and ignore missing unit)	**B1**	**[3]**