UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the May/June 2012 question paper

for the guidance of teachers

5054 PHYSICS

5054/42 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, which would have considered the acceptability of alternative answers.

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1	**(a)**	**(i)**	thermometer drawn with bulb in centre of liquid	B1	[1]
		(ii)	supported in the centre of the water/not touching beaker/no need to hold it/ holds scale facing you	B1	[1]
		(iii)	line of sight/view/eye (level) perpendicular to scale allow answers on Fig. 1.1	B1	[1]
	(b)	**(i)**	only timing every 2 minutes/time measured in minutes/reading to nearest second temperature changes slowly/long time to cool that precision not required/clock accurate enough/does not need 0.01/0.1s	B1	[1]
		(ii)	can see/read/notice thermometer and timer together can measure temperature **and** time more accurately or quickly	B1	[1]
	(c)	**(i)**	axes: correct way round, labelled quantity and unit *y*: 2 cm ≡ 10°C *x*: 2 cm ≡ 2 minutes	B1	
			scales: more than ½ page, sensible	B1	
			points plotted accurately	B1	
			best fit curved line neatly drawn	B1	[4]
		(ii)	cannot fall below/only falls to room temperature/temperature of surroundings	B1	[1]
		(iii)	1.2 to 1.4 minutes ecf graph	B1	[1]
	(d)		time decreases/temperature falls/cools more quickly	B1	
			heat lost (more) quickly (from larger area) evaporates (more) quickly (from larger area)	B1	[2]

[Total: 13]

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2 **(a)** **(i)** length marked accurately from support to centre of bob B1 [1]

(ii) measuring instrument stated
and additional detail how it is used
e.g.
add ½ measured diameter bob
mark string (at correct length)
measure from support to top and bottom of bob then average
vertical rule + set-square described or drawn B1 [1]

(b) ∑ times ÷ 60 explained/correct equation B1 [1]

(c) 10(.043) C1

10.0 (m/s^2) A1 [2]

(d) repeat for different value(s) of length (and average) B1 [1]

[Total: 6]

3 **(a)** **(i)** A and B in series with cell and switch B1

C labelled and in parallel with cell B1 [2]

(ii) voltmeter across A B1 [1]

(b)

Both lamp X and lamp Y are faulty	
Only lamp X is faulty	
Only lamp Y is faulty	
The cell is running down	✓
A connecting lead from the cell is broken	
The current in lamp X and lamp Y is too small	✓

B2 [2]

[Total: 5]

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4 (a) (i) S/south B1 [1]

(ii) same as **(a)(i)** B1 [1]

(iii) bar not magnetised/soft iron/
compass induces magnetism in bar/
N pole in centre of bar/
no keepers on magnet in drawer B1 [1]

(b) marks may be awarded for clear diagram

in text	on diagram	
compass near magnet **and mark** end of plotting compass	**magnet** drawn with compass(near) with **dot shown**	M1
point to first mark, mark other end (along one field line)	new compass position along same correct field line OR series of dots along one correct field line	A1
continue to other pole or edge of paper OR join dots to give line OR repeat (to produce more field lines)	line of compasses or dots to other pole or edge of paper OR dots joined to give line OR more than 1 correct field line drawn	A1

[3]

[Total: 6]

[Total: 30]

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