UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2011 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)	move lens (along the ruler) / moves object and screen together (lens not moved)	B1	[1]
		(ii)	(horizontally) align (centres) of object, lens and screen / raise object / lower lens (allow raise screen)	B1	[1]
		(iii)	any sensible answer for finding middle of side of block, e.g. how non-parallax used such as viewed from above measuring of length of block and divide by 2	B1	[1]
	(b)	(i)	0.14 m cao	B1	[1]
		(ii)	0.245(1) m allow 0.25 m	B1	[1]
	(c)	(i)	axes: labels correct way round, labelled quantity and unit scales: more than ½ grid, sensible, values consistent with labels 2 cm ≡ 0.1 cm on both axes points plotted accurately straight line of best fit neatly drawn through all points	B1 B1 B1 B1	[4]
		(ii)	0.97 to 1 ignore unit correct use of at least half graph line ($\Delta D \geq 0.2$) shown on graph or in calculation	B1 B1	[2]
		(iii)	0.24 m to 0.25 m	B1	[1]
	(d)		(more accurate because) gradient / more readings gives **average** (of different readings) / can ignore anomalous points / straight line from many/several points	B1	[1]

[Total: 13]

2	(a)	(i)	circuit with power supply and given wire with ammeter in series variable resistor / variable power supply	B1 B1	[2]
		(ii)	decrease variable resistor/resistance (of variable resistor) / increase supply voltage / increase number of cells	B1	[1]
		(iii)	reverse connections to battery/cell / change polarity of battery (accept reverse wire in the field)	B1	[1]
		(iv)	turn magnet other way up / S-pole on top and N-pole under wire / change polarity of magnets	B1	[1]
	(b)		wire becomes hot / melts / fuses / burns / trips power supply / damages/fuses ammeter	B1	[1]

[Total: 6]

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3 **(a)** **(i)** movement of water/purple colour/crystal clear(er)/takes longer/more visible (to class) B1 [1]

(ii) water stops moving B1 [1]

(iii) water moves slowly ora e.g. all happens too quickly B1 [1]

(b) arrow(s) up start from/above crystal B1
arrow(s) to left near bottom of water / arrow(s) down on right B1 [2]

(c) water/beaker already warm / water already coloured B1 [1]

[Total: 6]

4 **(a)** solid state detector / Geiger counter / Geiger-Muller/Geiger/GM tube B1 [1]

(b) **(i)** 53.6 / 54 / 0.447 seen / ÷120 seen / Σvalues/5 C1
0.45 cao A1 [2]

(ii) (radioactive) decay is random (in time) B1 [1]

(c) no (radiation) source / count rate low / always present (in environment) / no (additional) hazard / source is in lead box B1 [1]

[Total: 5]

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