UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Ordinary Level

MARK SCHEME for the October/November 2011 question paper for the guidance of teachers

5054 PHYSICS

5054/41 Paper 4 (Alternative to Practical), maximum raw mark 30

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1 (a) (i) (*h* marked on) vertical line from floor to **bottom** of pendulum B1 [1]

(ii) eye / E labelled level with bottom of pendulum/candidate's line in **(a)(i)** B1 [1]

(b) (i) time too large / lose count / amplitude decays / stops swinging B1 [1]

(ii)

T	T^2
3.062 / 3.06	9.38 / 9.36
2.992 / 2.99	8.95 / 8.94
2.918 / 2.92	8.51 / 8.53
2.846 / 2.85	8.10 / 8.12
2.774 / 2.77	7.70 / 7.67
2.698 / 2.70	7.28 / 7.29

T values correct to 3 or 4 s.f. B1
T^2 values correct (ecf T) B1
T^2 to 3 sf B1 [3]

(iii) axes: correct way round, labelled quantity and unit B1
scales: more than ½ grid, sensible B1
points plotted accurately within ½ small square B1
best fit straight line neatly drawn B1 [4]

(iv) straight line / linear **AND** negative gradient / inversely related / one increases other decreases B1 [1]

[Total: 11]

2 (a) goes down B1 [1]

(b) use a **known mass** (stated or implied) with link to cm / marks on scale B1 [1]

(c) (i) 1.5 cao B1 [1]

(ii) 3.8 cao B1 [1]

(iii) 0.76 (unit not required) ecf 0.3 × **(c)(ii)** / **(c)(i)** B1 [1]

(d) no electricity needed / cheaper / easy to build / more sensitive / precise B1 [1]

[Total: 6]

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3	**(a)**	Y-shift **AND** X-shift	B1	[1]
	(b)	connections from either side of cell / resistor to Y inputs	B1	[1]
	(c) **(i)**	2 V cao	B1	[1]
	(ii)	1.4 to 1.6 V	B1	[1]
	(d) **(i)**	dot moves down NOT to centre	B1	[1]
	(ii)	dot moves horizontally / (dot becomes) (horizontal) line (on screen)	B1	[1]
				[Total: 6]
4	**(a)** **(i)**	normal drawn correctly	B1	[1]
	(ii)	*i* marked (ecf incorrectly drawn normal)	B1	[1]
	(iii)	29° to 31° (ecf **(ii)**)	B1	[1]
	(b) **(i)**	line drawn parallel to and 5 cm ±1 mm below upper surface of block	B1	[1]
	(ii)	line through (within 1 mm of) crosses M_1 and M_2 to candidate's line in **(b)(i)**	B1	[1]
	(iii)	ray drawn within block	B1	[1]
	(c)	14° to 20°	B1	[1]
				[Total: 7]

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