UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS GCE Ordinary Level

MARK SCHEME for the October/November 2009 question paper for the guidance of teachers

5054 PHYSICS

5054/04

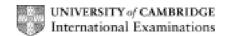
Paper 4 (Alternative to Practical), maximum raw mark 30

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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Page 2	Mark Scheme: Teachers' version	Syllabus	Paper
	GCE O LEVEL – October/November 2009	5054	04

1	(a)	mass / weight difference between two halves / rule not uniform / C of G or C of M not in centre of rule / not at 50 cm mark / one end (not A) worn away / damaged / holes drilled in one end			
		(ignore comments on forces / moments / fulcrum / prism)			[1]
	(b)	(i)	88.4 ± 0.2 (cm) unit not required	B1	
		(ii)	38.4 ± 0.2 cm OR (b) (i) – 50 correct unit required	B1	[2]
	(c)	axes: correct way round, labelled quantity and unit minimum two values (excluding 0,0) on each axis		B1	
		scales: more than ½ page, sensible, linear x-axis: 2 cm = 100g or 80g y-axis: 2 cm = 10 cm or 8 cm		B1	
		5 given points plotted accurately, $\pm1/2$ smallest square (for sensible scales only) / ignore point at 50g		B1	
		reasonable attempt at best fit curve neatly drawn from 75g to 400g, not going below 4cm / ignore line outside points		B1	[4]
	(d)	(i)	points on graph should be evenly spaced/uniform / large gap (between 200g and 400g) explained somehow allow more accurate with reference to graph / curve / results / experiment / conclusion / allow clearer graph / fewer gaps in graph	B1	[1]
		(ii)	6.5 ± 0.5 cm or answer correct from their graph correct unit required allow 6-7 cm / allow even if scale not sensible	B1	
			marking clearly shown on graph at their value minimum requirement: clear mark on curve at 300g	B1	[2]
	(e)	d > 50 cm / metre rule not long enough allow distance too large/ too close to end of ruler / value of d too high ignore distance large / cannot balance ruler / comments relating to graph		B1	[1]
				[Total: 11]	
2	(a)		ndle wheel / measuring tape / more than one metre rule / metre tape ore 10 m ruler	B1	[1]
	(b)	know when to start stopwatch / when sound is made / when pistol fired		B1	[1]
	(c)		oid echoes / reflections / sound bouncing off buildings ore noise from surroundings / sound hits buildings	B1	[1]

	Page 3		Mark Scheme: Teachers' version	Syllabus	Pap	er
			GCE O LEVEL – October/November 2009	5054	04	4
	(d)	mark 1 and 2 together any TWO sensible suggestions, e.g.				
		reactions too slow				
		ignore just human error				
		stopwatch faulty / failed to start / stop / not at zero				
		time interval too short / speed too fast / distance too short				
		poor hearing / could not hear the bang				
		poor eyesight / could not see the smoke				
		different distances (from teacher)				
			oncentration / not paying attention ulty pistol		B2	[2]
		NOT parallax error				
	(e)		arger / speed quicker kes less time / hears sound quicker		B1	[1]
				[T	otal: 6]	
3	(a)	allow pa	nt from a distant object rallel light mentioned / at least 2 parallel rays drawn ess arrow shown)	(not including	B1	
			ens/focuses light onto a screen /15 correctly marked on ray diagram		B1	
			s from lens to screen / image / repeats for all 3 lenses concave lens drawn		B1	[3]
	(b)	N increas	ses, f decreases / inverse relationship		C1	
		•	proportional / N x f = constant x 1 mark if focal point used for focal length		A1	[2]
		allow one	e mark if inversely proportional stated then incorrect de	escription		

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[Total: 5]

Page 4		Mark Sche	me: Teachers' version	Syllabus	Paper	
		GCE O LEVEL	- October/November 2009	5054	04	
(a)	circuit containing power supply, wire, resistor (allow variable R), (switch) and					
	ammeter drawn in series with wire voltmeter drawn in parallel with wire				B1 B1	[2]
	allow any representation clearly ammeter and voltmeter / meters drawn on Fig 4.1 ignore gaps in circuit max 1 if resistor drawn as fuse					
(b)	makes current small / stops wire heating up / overheating / melting allow controls / limits current / protects ammeter ignore resists the current / varies the current / no damage to wire / comments				B1 on safety	[1]
(c)	(i) 1.4	V	cao unit required		B1	
	(ii) 78 r	mA / .078 A	cao unit required		B1	[2]
(d)	0.33 (0	.326) (mm)	ecf (c) (i) and (ii)		B1	
	Their answer correctly rounded to 2 s.f.				B1	[2]
	ecf 78 A in (c) (ii) gives 10(.3) mm so 10 scores 2 marks					
(e)		eter / screw gauge liper ecf (d) ≥ 9 mm			B1	[1]

[Total: 8]

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