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## **CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**International General Certificate of Secondary Education** 

## MARK SCHEME for the October/November 2013 series

## 0625 PHYSICS

0625/61

Paper 6 (Alternative to Practical), maximum raw mark 40

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.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.



	Page 2	Mark Scheme	Syllabus	Paper	
		IGCSE – October/November 2013	0625	61	
1	(a) rule bala	nced <u>and</u> pivot at centre of mass		[1]	
	OR add	take readings from 50.2 cm mark mass/weight/load e pivot at 50.2 cm mark		[41]	
	OK place	e pivot at 50.2 cm mark		[1]	
	(c) (i) cm,	cm		[1]	
		kwise 77.5 (or 78) (Ncm) clockwise 78 (Ncm)		[1]	
		repeats nate between two best positions that almost balance ble method to locate centre of mass <b>Q</b>	e but tip opposite s	sides o.w.t.t.e [1]	
				[Total: 5]	
2	(a) 87 (°C)			[1]	
	<b>(b) (i)</b> s, °C	C, °C		[1]	
	` , ` ,	<b>B</b> <u>and</u> greater temperature difference OR numbers quoted, <i>must</i> see 21 and 8 or 24 and	5	[1]	
	(iv) A 23	8(°C) and <b>B</b> 40(°C)		[1]	
	<b>(v)</b> 20 –	26 (°C)		[1]	
		viewing thermometer at right angles ence to being ready on time		[1]	
		nperature			
	distance	tarting temperature of thermometer bulb from water surface reference to draughts / fans / air conditioning		[2]	
	TOTOVAITE	roto. Street to dradgitto / land / all conditioning		[Total: 8]	
				[. 5.41. 0]	

Page 3						Mark	Schen	ne			Sy	llabus	Р	aper	
				IGC					er 2013					61	
(a)	(i)														[1] [1]
	(ii)	P <sub>1</sub> =	0.54	(W) e.d	c.f. allo	owed									[1]
	(iii)	(iv)(v	/) P	= 1.59	(or 1.	6) W									[1]
(b)											ntal accu	ıracy o.w	v.t.t.e.		[1] [1]
(c)	(i)	lamp for v	ps in /ariab	le resis	tor, la	mps a	nd volt			power	supply,	with cor	rect sym	bols	[1] [1]
	(ii)	vary	curr	ent (or p	o.d.)										[1]
														[Tota	l: 9]
(a)	(i)(ii														[1] [1]
(b)	(i)(ii	OF	₹ 11.4	14 <u>cm²</u> a			7) <u>cm</u>								[1]
	(iii)					•	or 1.63	or 1.6	634)						[1]
(c)						•		or 163	3.4 <u>mm</u> )						[1] [1]
(d)	up t	o 0.5	ōcm e	either si	de of	18.2 cr	m								[1]
(e)	use mar plac ens lens	of dak pos k pos ce me ure o s / ob	arken sition etre r object	of cent ule on b and ler	re of le ench ns are	ens or (or cla same	n holde amp in heigh	er position t from	on)		ering				
			ce of	parallax	with	action	and re	eason							[2]
														[Tota	l: 9]
	(a) (b) (c) (d)	(a) (i) (ii) (iii) (b) stat justification (c) (i) (ii) (iii) (a) (i)(ii (iii) (b) (i)(ii (iii) (c) f = f give f give (d) up t (e) any use man place ensure place	(a) (i) 1.8 0.3 (ii) P <sub>1</sub> = (iii)(iv)(v)  (b) stateme justificate for v one (iii) vary  (a) (i)(ii) u = v = (iii) x = e.c.  (b) (i)(ii) 11 Of e.c.  (iii) x = e.c.  (c) f = 16 or f given to (iii) x = e.c.  (d) up to 0.5  (e) any two use of d mark poplace meens ure of dens for the content of	(a) (i) 1.8 (V) 0.3 (A)  (ii) P <sub>1</sub> = 0.54  (iii)(iv)(v) P <sub>1</sub> (b) statement man justification in for variab one voltm  (ii) vary curre  (a) (i)(ii) u = 26 (v = 44 (iii)) vary curre  (b) (i)(ii) 1144 min OR 11.4 e.c.f. from OR 11.4 e.c.f. from e.c.f. from e.c.f. from one voltm  (c) f = 16 or 16.3 f given to 2 or ensure object lens / object / repeats	(a) (i) 1.8 (V) 0.3 (A)  (ii) P <sub>1</sub> = 0.54 (W) e.c.  (iii)(iv)(v) P <sub>T</sub> = 1.59  (b) statement matches rejustification in terms of the content o	(a) (i) 1.8 (V) 0.3 (A)  (ii) $P_1 = 0.54$ (W) e.c.f. allowing (iii) (iv) (v) $P_T = 1.59$ (or 1.)  (b) statement matches results justification in terms of with lamps in parallel, variated for variable resistor, lated one voltmeter correctly (ii) vary current (or p.d.)  (a) (i)(ii) $u = 26$ (mm) or 2.6 (over 44 (mm) or 4.4 (over 44 (mm)) or 4.4 (over 44 (mm)) or 4.4 (over 44 (mm)) or 4.5 (over 44 (mm)) or 4.4 (over	(a) (i) 1.8 (V) 0.3 (A)  (ii) P <sub>1</sub> = 0.54 (W) e.c.f. allowed (iii)(iv)(v) P <sub>T</sub> = 1.59 (or 1.6) W  (b) statement matches results (experiment justification in terms of within or because of variable resistor, lamps are one voltmeter correctly positive (ii) vary current (or p.d.)  (a) (i)(ii) u = 26 (mm) or 2.6 (cm) v = 44 (mm) or 4.4 (cm)  (b) (i)(ii) 1144 mm² and 70 mm OR 11.44 cm² and 7.0 (or 70 e.c.f. from (a)  (iii) x = 16 or 16.3 or 16.34 (1.6 or 60 e.c.f. from (b)(i) and (ii)  (c) f = 16 or 16.3 or 16.34 cm (160 or f given to 2 or 3 significant figures)  (d) up to 0.5 cm either side of 18.2 cm  (e) any two from: use of darkened room / brighter I mark position of centre of lens or place metre rule on bench (or claensure object and lens are same lens / object / screen perpendicure repeats	(a) (i) 1.8 (V) 0.3 (A)  (ii) P <sub>1</sub> = 0.54 (W) e.c.f. allowed  (iii)(iv)(v) P <sub>T</sub> = 1.59 (or 1.6) W  (b) statement matches results (expect YES justification in terms of within or beyond for variable resistor, lamps and voltagenerate voltmeter correctly positioned (ii) vary current (or p.d.)  (a) (i)(ii) u = 26 (mm) or 2.6 (cm) v = 44 (mm) or 4.4 (cm)  (b) (i)(ii) 1144 mm² and 70 mm OR 11.44 cm² and 7.0 (or 7) cm e.c.f. from (a)  (iii) x = 16 or 16.3 or 16.34 (1.6 or 1.63 e.c.f. from (b)(i) and (ii)  (c) f = 16 or 16.3 or 16.34 cm (160 or 163 or f given to 2 or 3 significant figures  (d) up to 0.5 cm either side of 18.2 cm  (e) any two from: use of darkened room / brighter lamp / mark position of centre of lens on holder place metre rule on bench (or clamp in ensure object and lens are same heighlens / object / screen perpendicular to be repeats	(a) (i) 1.8 (V) 0.3 (A)  (ii) P <sub>1</sub> = 0.54 (W) e.c.f. allowed (iii)(iv)(v) P <sub>T</sub> = 1.59 (or 1.6) W  (b) statement matches results (expect YES) e.c.; justification in terms of within or beyond limits for variable resistor, lamps and voltmeter one voltmeter correctly positioned (ii) vary current (or p.d.)  (a) (i)(ii) u = 26 (mm) or 2.6 (cm) v = 44 (mm) or 4.4 (cm)  (b) (i)(ii) 1144 mm² and 70 mm OR 11.44 cm² and 7.0 (or 7) cm e.c.f. from (a)  (iii) x = 16 or 16.3 or 16.34 (1.6 or 1.63 or 1.6 e.c.f. from (b)(i) and (ii)  (c) f = 16 or 16.3 or 16.34 cm (160 or 163 or 163 f given to 2 or 3 significant figures  (d) up to 0.5 cm either side of 18.2 cm  (e) any two from: use of darkened room / brighter lamp / no oth mark position of centre of lens on holder place metre rule on bench (or clamp in positiensure object and lens are same height from lens / object / screen perpendicular to bench	(a) (i) 1.8 (V) 0.3 (A)  (ii) P <sub>1</sub> = 0.54 (W) e.c.f. allowed  (iii)(iv)(v) P <sub>T</sub> = 1.59 (or 1.6) W  (b) statement matches results (expect YES) e.c.f. allowed justification in terms of within or beyond limits of exp  (c) (i) diagram: lamps in parallel, variable resistor in series with for variable resistor, lamps and voltmeter one voltmeter correctly positioned  (ii) vary current (or p.d.)  (a) (i)(ii) u = 26 (mm) or 2.6 (cm) v = 44 (mm) or 4.4 (cm)  (b) (i)(iii) 1144 mm² and 70 mm OR 11.44 cm² and 7.0 (or 7) cm e.c.f. from (a)  (iii) x = 16 or 16.3 or 16.34 (1.6 or 1.63 or 1.634) e.c.f. from (b)(i) and (ii)  (c) f = 16 or 16.3 or 16.34 cm (160 or 163 or 163.4 mm) f given to 2 or 3 significant figures  (d) up to 0.5 cm either side of 18.2 cm  (e) any two from: use of darkened room / brighter lamp / no other light mark position of centre of lens on holder place metre rule on bench (or clamp in position) ensure object and lens are same height from the belens / object / screen perpendicular to bench repeats	(a) (i) 1.8 (V) 0.3 (A)  (ii) P <sub>1</sub> = 0.54 (W) e.c.f. allowed  (iii)(iv)(v) P <sub>T</sub> = 1.59 (or 1.6) W  (b) statement matches results (expect YES) e.c.f. allowed justification in terms of within or beyond limits of experiment lamps in parallel, variable resistor in series with power for variable resistor, lamps and voltmeter one voltmeter correctly positioned  (ii) vary current (or p.d.)  (a) (i)(ii) u = 26 (mm) or 2.6 (cm) v = 44 (mm) or 4.4 (cm)  (b) (i)(iii) 1144 mm² and 70 mm OR 11.44 cm² and 7.0 (or 7) cm e.c.f. from (a)  (iii) x = 16 or 16.3 or 16.34 (1.6 or 1.63 or 1.634) e.c.f. from (b)(i) and (ii)  (c) f = 16 or 16.3 or 16.34 cm (160 or 163 or 163.4 mm) f given to 2 or 3 significant figures  (d) up to 0.5 cm either side of 18.2 cm  (e) any two from: use of darkened room / brighter lamp / no other light interfer mark position of centre of lens on holder place metre rule on bench (or clamp in position) ensure object and lens are same height from the bench lens / object / screen perpendicular to bench repeats	(a) (i) 1.8 (V) 0.3 (A)  (ii) P <sub>1</sub> = 0.54 (W) e.c.f. allowed (iii)(iv)(v) P <sub>T</sub> = 1.59 (or 1.6) W  (b) statement matches results (expect YES) e.c.f. allowed justification in terms of within or beyond limits of experimental accurate lamps in parallel, variable resistor in series with power supply, for variable resistor, lamps and voltmeter one voltmeter correctly positioned  (ii) vary current (or p.d.)  (a) (i)(ii) u = 26 (mm) or 2.6 (cm) v = 44 (mm) or 4.4 (cm)  (b) (i)(iii) 1144 mm² and 70 mm OR 11.44 cm² and 7.0 (or 7) cm e.c.f. from (a)  (iii) x = 16 or 16.3 or 16.34 (1.6 or 1.63 or 1.634) e.c.f. from (b)(i) and (ii)  (c) f = 16 or 16.3 or 16.34 cm (160 or 163 or 163.4 mm) f given to 2 or 3 significant figures  (d) up to 0.5 cm either side of 18.2 cm  (e) any two from: use of darkened room / brighter lamp / no other light interfering mark position of centre of lens on holder place metre rule on bench (or clamp in position) ensure object and lens are same height from the bench lens / object / screen perpendicular to bench repeats	(a) (i) 1.8 (V) 0.3 (A)  (ii) P <sub>1</sub> = 0.54 (W) e.c.f. allowed (iii)(iv)(v) P <sub>T</sub> = 1.59 (or 1.6) W  (b) statement matches results (expect YES) e.c.f. allowed justification in terms of within or beyond limits of experimental accuracy o.w.  (c) (i) diagram: lamps in parallel, variable resistor in series with power supply, with corfor variable resistor, lamps and voltmeter one voltmeter correctly positioned  (ii) vary current (or p.d.)  (a) (i)(ii) u = 26 (mm) or 2.6 (cm) v = 44 (mm) or 4.4 (cm)  (b) (i)(ii) 1144 mm² and 70 mm OR 11.44 cm² and 7.0 (or 7) cm e.c.f. from (a)  (iii) x = 16 or 16.3 or 16.34 (1.6 or 1.63 or 1.634) e.c.f. from (b)(i) and (ii)  (c) f = 16 or 16.3 or 16.34 cm (160 or 163 or 163.4 mm) f given to 2 or 3 significant figures  (d) up to 0.5 cm either side of 18.2 cm  (e) any two from: use of darkened room / brighter lamp / no other light interfering mark position of centre of lens on holder place metre rule on bench (or clamp in position) ensure object and lens are same height from the bench lens / object / screen perpendicular to bench repeats	(a) (i) 1.8 (V) 0.3 (A)  (ii) $P_1 = 0.54$ (W) e.c.f. allowed  (iii)(iv)(v) $P_7 = 1.59$ (or 1.6) W  (b) statement matches results (expect YES) e.c.f. allowed justification in terms of within or beyond limits of experimental accuracy o.w.t.t.e.  (c) (i) diagram: lamps in parallel, variable resistor in series with power supply, with correct sym for variable resistor, lamps and voltmeter one voltmeter correctly positioned  (ii) vary current (or p.d.)  (a) (i)(ii) $u = 26$ (mm) or 2.6 (cm) $v = 44$ (mm) or 4.4 (cm)  (b) (i)(iii) $1144$ mm² and 70 mm OR 11.44 cm² and 7.0 (or 7) cm e.c.f. from (b)(i) and (ii)  (c) $f = 16$ or 16.3 or 16.34 (1.6 or 1.63 or 1.634) e.c.f. from (b)(i) and (iii)  (d) up to 0.5 cm either side of 18.2 cm  (e) any two from: use of darkened room / brighter lamp / no other light interfering mark position of centre of lens on holder place metre rule on bench (or clamp in position) ensure object and lens are same height from the bench lens / object / screen perpendicular to bench repeats avoidance of parallax with action and reason	(a) (i) 1.8 (V) 0.3 (A)  (ii) P <sub>1</sub> = 0.54 (W) e.c.f. allowed (iii)(iv)(v) P <sub>T</sub> = 1.59 (or 1.6) W  (b) statement matches results (expect YES) e.c.f. allowed justification in terms of within or beyond limits of experimental accuracy o.w.t.t.e.  (c) (i) diagram: lamps in parallel, variable resistor in series with power supply, with correct symbols for variable resistor, lamps and voltmeter one voltmeter correctly positioned  (ii) vary current (or p.d.)  [Tota  (a) (i)(ii) u = 26 (mm) or 2.6 (cm) v = 44 (mm) or 4.4 (cm)  (b) (i)(ii) 1144 mm² and 70 mm OR 11.44 cm² and 7.0 (or 7) cm e.c.f. from (a)  (iii) x = 16 or 16.3 or 16.34 (1.6 or 1.63 or 1.634) e.c.f. from (b)(i) and (ii)  (c) f = 16 or 16.3 or 16.34 cm (160 or 163 or 163.4 mm) f given to 2 or 3 significant figures  (d) up to 0.5 cm either side of 18.2 cm  (e) any two from: use of darkened room / brighter lamp / no other light interfering mark position of centre of lens on holder place metre rule on bench (or clamp in position) ensure object and lens are same height from the bench lens / object / screen perpendicular to bench (repeats)

Page 4	Mark Scheme	Syllabus	Paper
	IGCSE – October/November 2013	0625	61

**5** (a) 54 – 55 [1]

(b) (i) table:
 e values 12, 22, 36, 50, 60 (e.c.f. from (a))

(ii) graph:
 axes correctly labelled e/mm and F/N and correct way round
 suitable scales
 all plots correct to ½ small square
 good line judgement
 thin, single continuous line

[1]

(iii) triangle method using at least half of candidate's line, shown on the graph G = 11 - 13, no e.c.f. [1]

[Total: 9]