MARK SCHEME for the May/June 2013 series

0625 PHYSICS

0625/22

Paper 2 (Core Theory), maximum raw mark 80

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 May/June 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 – May/June 2013	0625	22

NOTES ABOUT MARK SCHEME

- B marks are independent marks, which do not depend on any other marks. For a B mark to be scored, the point to which it refers must actually be seen in the candidate's answer.
- M marks are method marks upon which accuracy marks (A marks) later depend. For an M mark to be scored, the point to which it refers **must** be seen in a candidate's answer. If a candidate fails to score a particular M mark, then none of the dependent A marks can be scored.
- C marks are compensatory method marks which can be scored even if the points to which they refer are not written down by the candidate, provided subsequent working gives evidence that they must have known it, e.g. if an equation carries a C mark and the candidate does not write down the actual equation but does correct working which shows he knew the equation, then the C mark is scored.
- A marks are accuracy or answer marks which either depend on an M mark, or which are one of the ways which allow a C mark to be scored.
- c.a.o. means "correct answer only".
- e.c.f. means "error carried forward". This indicates that if a candidate has made an earlier mistake and has carried his incorrect value forward to subsequent stages of working, he may be given marks indicated by e.c.f. provided his subsequent working is correct, bearing in mind his earlier mistake. This prevents a candidate being penalised more than once for a particular mistake, but **only** applies to marks annotated "e.c.f."
- e.e.o.o. means "each error or omission".
- brackets () around words or units in the mark scheme are intended to indicate wording used to clarify the mark scheme, but the marks do not depend on seeing the words or units in brackets, e.g. 10 (J) means that the mark is scored for 10, regardless of the unit given.
- underlining indicates that this must be seen in the answer offered, or something very similar.
- OR/or indicates alternative answers, any one of which is satisfactory for scoring the marks.
- Spelling Be generous about spelling and use of English. If an answer can be understood to mean what we want, give credit.

Significant figures

Answers are acceptable to any number of significant figures 2, except if specified otherwise, or if only 1 sig. fig. is appropriate.

- Units Incorrect units are not penalised, except where specified. More commonly, marks are allocated for specific units.
- Fractions These are only acceptable where specified.
- Extras Ignore extras in answers if they are irrelevant; if they contradict an otherwise correct response or are forbidden by mark scheme, use right + wrong = 0
- Ignore Indicates that something which is not correct is disregarded and does not cause a right plus wrong penalty.
- Not/NOT Indicates that an incorrect answer is not to be disregarded, but cancels another otherwise correct alternative offered by the candidate i.e. right plus wrong penalty applies.

	Page 3		5	Mark Scheme	Syllabus	Paper
				IGCSE – May/June 2013	0625	22
1	(a)	(i)	use 25 (r	of 2.55 (or 1455) <u>and</u> 3.20 (or 1520) nins)		C1 A1
		(ii)	yes/	no, compatible with candidate's time		B1
	(b)	(sp 6 / :	eed = 25 OF	[:]) distance ÷ time in any form R 6000 / 25 OR 6 / (25 × 60) OR 6000 / 1500 e.c.f. (a)	C1
		OR 4 (n allo	0.24 n/s) w e.c	OR 240 OR 0.004 (no e.c.f. if working not shown) .f. from (a) if working shown		C1 A1
						[Total: 6]
2	(a)	(i)	mon acce	nent ept torque		B1
		(ii)	F at/	near L.H. edge (ignore not vertical)		B1
	(b)	(i)	idea acce	of toppling ept falls (over/onto its side)		
			igno	re slides		B1
		(ii)	abo\ <u>verti</u>	ve or just beyond edge of box OR outside base of be <u>cally</u> above edge of box OR above <u>R.H.</u> edge of box	ЭХ К	C1 A1
	(c)	mig idea	ht top a of (\	ople accept fall (over/forwards) vertical through) Centre of Mass being outside base		M1
		OR spe	clock cial c	wise moment becomes too great ase: accept for 1 mark might jam/catch hand betwe	en drawers	A1
						[Total: 7]

	Page 4		Mark Scheme	}	Syllabus	Paper
			IGCSE – May/June	2013	0625	22
3	(a)	ruler acce	vertical OR ruler close ot use a ruler			B1
		EITH	ER			
		mea	ure length before and after			
		OR	ote position of bottom before and af	ier		M1 Δ1
		Cub				,(1
		OR				
		put r	iler zero at bottom of spring reading of bottom after load applied			M1 A1
	(b)	(i)	8 and 297 (both)			B1
,	(~)	(-)	o <u>ana</u> 201 (2011)			2.
		(ii)	ignore $(0, 0)$ not plotted)			B3
				Square -1 e.e.o.o.		DZ
	(iii)	.49 (mm) OR 239 (mm) OR 2 (N) OR	49 (mm)		B1
	(iv)	ood straight line through points and	(0, 0)		B1
		(v)	loubles			B1
			lirectly proportional			B1
			I inversely/indirectly proportional			
						[Total: 10]
4	(a)	liqui	/alcohol/mercury/reading (level) rise	s/increases/moves	along the tube/ex	kpands B1
		igno	e temperature increases			
	(h)	liqui	ovpands OP liquid molecules get fu	uthor apart		B1
	(0)	nqui	expands ON liquid molecules get it	inner apart		
	(c)	arro	indicating 100 °C by eye			B1
			- , ,			
	(d)	idea	of large movement of thread (for sm	all temperature cha	ange)	B1
		acce	ot it increases sensitivity o.w.t.t.e.	·		
						[Total: 4]

	Page 5		Mark Scheme	Syllabus	Paper
			IGCSE – May/June 2013	0625	22
5	(a) liq ga sc ar ot	juid, co as, con blid ny 1 co her 2 c	ndone named liquid done named gas rrect orrect		B1 B1
	(b) (i)) melt	ing/fusion		B1
	(ii)) conc	lensation		B1
	(iii)) evap	poration OR boiling		B1
					[Total: 5]
6	(a) cc fo	orrect ic cal len	lea of focal length gth accurately shown ± 1 mm		C1 A1
	(b) (i)) ray f (igno OR ray f (NO imag	from top of object parallel to axis as far as lens, ther bre point of refraction, as long as somewhere on len from top of object, straight through centre of lens TE: ray need not intersect printed one to score M1) ge drawn perpendicularly between intersection of ca	n down through F ₁ ls) Indidate's rays and	M1 Laxis A1
	(ii)) dimi inve igno	nished o.w.t.t.e. rted (ignore laterally) OR upside down re brightness, ignore direction is changed, accept d	irection is reversed	B1 B1
					[Total: 6]

Page 6	Mark Scheme	Syllabus	Paper
	IGCSE – May/June 2013	0625	22

7 (a)

-

	switches closed					
iamp that is it	1	2	3	4	5	
lamp A only	\checkmark	\checkmark	\checkmark			
lamp B only	\checkmark	\checkmark		\checkmark		
lamp C only	\checkmark				\checkmark	

 \checkmark

Β1

Β1

ignore any additions for lamp A for C allow B1 only for ✓

(b) all of them OR A, B and C

(c) (switch) 1

		[To	tal: 5]
8	(a) (i)	charge OR charged particles OR electrons	B1
	(ii)	p.d./cell/battery/e.m.f. across it OR move in a magnetic field OR connect to positive AND negative of power supply ignore connect to a battery	е В1
	(iii)	A OR amp(s) OR ampere(s)	B1
	(b) (i)	<i>R</i> ₁ + <i>R</i> ₂ OR 8 + 4 12Ω	C1 A1
	(ii)	V = <i>IR</i> in any form OR <i>V/R</i> 6 / 12 0.5 A	C1 C1 A1
	(iii)	 decreases, ignore numbers decreases, ignore numbers 	B1 B1
		[Tota	al: 10]

 \checkmark

	Page 7		,	Mark Scheme	Syllabus	Paper
				IGCSE – May/June 2013	0625	22
9	(a)	(i)	copp	ber		B1
		(ii)	iron,	accept (silicon) steel		B1
	(b)	V ₁ / cori 20	/ V ₂ = rect s	N_1 / N_2 in any form ubstitution e.g. 240 / 6 = 800 / N_2		C1 C1 A1
	(c)	(i)	idea acce	that they would blow/burn out opt blow up		B1
		(ii)	2 or	more lamps in parallel across AB and none in serie	S	B1
						[Total: 7]
10	(a)	(i)	basi basi no li	c pattern correct, three lines c pattern correct, five lines or more nes meeting or crossing, even at magnet ends		C1 A1 B1
		(ii)	direc	ction arrow correct (condone more than one unless	any of them wron	g) B1
	(b)	(i)	basi lines	c pattern correct outside coil, four lines or more present and continuous and not touching within co	re	B1 B1
		(ii)	iron igno	/ steel re magnet/magnetic metal		B1
		(iii)	sole	noid		B1
						[Total: 8]

	Page 8		Mark Scheme	Syllabus	Paper
			IGCSE – May/June 2013	0625	22
11	I (a) gamma beta Ol alpha C any 1 c other 2		OR γ β R α rrect correct		B1 B1
	(b) 2r	nd state	ement ticked		B1
	(c) (i) 24(s	s) ± 0.5		B1
	(ii) 2			B1
	(iii) cano (24	didate's (i) ÷ candidate's (ii), correctly evaluated ÷ 2 = 12(s))		B1
					[Total: 6]
12	(a) (i) elec	tron		B1
	(ii) prot	on <u>and</u> neutron (both, either order)		B1
	(b) (i) (nur NOT	nber of) protons accept proton number F no. of protons and electrons		B1
	(ii) neut	tron(s)		B1
	(iii) 1. 1	7, accept 2, 8, 7		B1
		2. 1	7, accept 2, 8, 7		B1

[Total: 6]