UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the October/November 2006 question paper

0625 PHYSICS

0625/02 Paper 2 (Core Theory), maximum raw mark 80

This mark scheme is published as an aid to teachers and students, 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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

The grade thresholds for various grades are published in the report on the examination for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses.

- CIE will not enter into discussions or correspondence in connection with these mark schemes.

CIE is publishing the mark schemes for the October/November 2006 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

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NOTES ABOUT MARK SCHEME SYMBOLS

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.

un.pen. — means "unit penalty". An otherwise correct answer will have one mark deducted if the unit is wrong or missing. This **only** applies where specifically stated in the mark scheme. Elsewhere, incorrect or missing units are condoned.

OR/or — indicates alternative answers, any one of which is satisfactory for scoring the marks.

QU.		SCHEME				MARK
1	(a)	55 (s)				B1
	(b)	55/5 ecf				C1
		11 (s) ecf				A1
	(c)	EITHER	OR	OR	OR	
		300/hour	1 takes 11s	5 takes 55s	1hour for 300	B1
		= 5/min	300 take 3300s	300 take 60x55s	3600/300s for 1	B1
		takes less than 1 min for 5	less than 1hr for 300	less than 1hr for 300	1 takes less time than this	B1
		YES/NO ticked according to his working				B1 7
2		2nd box ticked				B1
		3rd box ticked (use ✓ + × = 0 for extras)				B1 2
3	(a)	OP accelerating				B1
		PQ accelerating				B1
		QR constant speed				B1
		RS slowing down (however expressed)				B1
	(b)	O and S (both)				B1
	(c)	6 (m/s)				B1
	(d)	70 (s)				B1
	(e)	find area OPQRS (however expressed)				B1 8
4	(a)	(i) radiation				B1
		(ii) conduction				B1
	(b)	(i) kinetic (however expressed)				B1
		potential (however expressed)				B1
		(ii) idea of energy loss or friction				B1 5

5	**(a)**	(magnitude of) force		B1
		distance (from fulcrum)		B1
	(b)	**(i)**	force	B1
			moment OR turning effect	B1
		(ii)	$F_1 + F_2 + W$	B1
		(iii)	F	B1 6
6	**(a)**	**(i)**	eye to image line perpendicular to mirror, by eye	B1
			object distance = image distance, by eye	B1
		(ii)	normal correctly drawn, by eye	B1
		(iii)	ray to bottom edge of mirror correct	M1
			reflected ray at correct angle to mirror, by eye (condone sloppy normal)	A1
	(b)	sensible attempt at explanation		B1
	(c)	**(i)**	2 (m) (NO ecf)	B1
		(ii)	distance lady to mirror = 3 (m)	C1
			distance moved = 2 (m) (NO ecf)	A1
			away from mirror/wall	B1 10
7	**(a)**	**(i)**	large, OR accept any large example e.g. cliff	B1
		(ii)	speed = distance/time OR speed = 2xdistance/time (in any form)	C1
			correct substitution	C1
			480 (m) c.a.o.	A1
	(b)	speed = 6/50 OR 3/50		C1
		0.12 (m/s) OR 0.06 (m/s)		A1 6

8	**(a)**	**(i)**	(group) 1	B1
		(ii)	(group) 2	B1
		(iii)	plastics OR glass OR ebonite	B1
	(b)		top – and bottom +	B1
	(c)		region/area/space etc.	B1
			charge	B1
			experiences a force	B1 7
9	**(a)**		good straight line through first 5 points, drawn with a rule	B1
	(b)		intelligent attempt at a reason	B1
	(c)		67 – 40	C1
			27 (mm)	A1
	(d)		2.4 – 2.5 (N)	B1 5
10	**(a)**		less turns on Sy OR more turns on Py	B1
	(b)		voltage OR p.d. OR volts is less	B1
	(c)		$V_1/V_2 = N_1/N_2$ in any form	C1
			correct substitution	C1
			12 (V)	A1
	(d)		voltage too high OR bell would be damaged	B1 6
11	**(a)**		92	B1
	(b)		orbit OR outside nucleus	B1
	(c)		146	B1
	(d)		nucleus	B1
	(e)		decreases	M1
			by 2	A1 6

12	**(a)**	reverse connections to ammeter or battery		B1
	(b)	current OR amps OR amperes		B1
	(c)	4 components in series (ignore symbols)		B1
		4 recognisably correct <u>symbols</u> (ignore connections)		B1
	(d)	**(i)** voltmeter OR multimeter on volts scale		B1
		(ii) voltmeter shown connected in parallel with resistor		B1
	(e)	I = V/R in any form		C1
		correct substitution	no ecf from wrong equation	C1
		0.4 (A) c.a.o.		A1
	(f)	his value of (e)		B1
	(g)	**(i)** 7.5 Ω ticked		B1
		(ii) increases current e.c.f.		B1
				12