UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the June 2005 question paper

0625 PHYSICS

0625/02 **Paper 2 (Theory), maximum 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 initially instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began. Any substantial changes to the mark scheme that arose from these discussions will be recorded in the published *Report on the Examination*.

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*.

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

CIE is publishing the mark schemes for the June 2005 question papers for most IGCSE and GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

Grade thresholds taken for Syllabus 0625 (Physics) in the June 2005 examination.

	maximum mark available	minimum mark required for grade:			
		A	C	E	F
Component 2	80	N/A	51	38	26

The threshold (minimum mark) for B is set halfway between those for Grades A and C.
The threshold (minimum mark) for D is set halfway between those for Grades C and E.
The threshold (minimum mark) for G is set as many marks below the F threshold as the E threshold is above it.
Grade A* does not exist at the level of an individual component.

June 2005

IGCSE

MARK SCHEME

MAXIMUM MARK: 80

SYLLABUS/COMPONENT: 0625/02

PHYSICS
Theory

Question			Scheme	Target Grade	Mark
1	(a)		100 – 20	F	C1
			level shown at 80 (ignore meniscus) ± 1mm (need not actually draw surface)	F	A1
	(b)	(i)	16 (cm)	F	B1
		(ii)	sub of (i) into formula	F	C1
			sub of 100 into formula	F	C1
			6.25 e.c.f. from (i)	F	A1
			cm^2	C	B1
			Accept working from any two correct values		7
2	(a)		2100 – 900	F	C1
			12 OR 10.06 (i.e. travel time)	F	A1
	(b)		1500 (ignore unit) OR 15.00 OR '1500 to 1800'	F	B1
	(c)		1	F	B1
	(d)	(i)	find area of first trapezium (or equivalent) bold area under graph	C	B1
		(ii)	find total area	C	M1
			divide by total time OR divide by 12 OR divide by travel time	C	A1
					7
3	(a)		it turns	F	M1
			clockwise	C	A1
	(b)	(i)	stationary OR nothing	F	B1
		(ii)	horizontal arrow (intention of from OR to pivot - condone gap, if clear)	F	M1
			to left	F	A1
			10 (N)	C	B1
					6
4	(a)		gravitational	F	B1
	(b)		kinetic	F	B1
	(c)		kinetic	C	B1
	(d)		electrical	F	B1
	(e)		internal ACCEPT heat condone valid extras	C	B1
					5

5	(a)	(i)	increased	F	B...
		(ii)	molecules move faster/have more energy	C	B1
			OR collisions more energetic		
			more frequent collisions (condone with each other)/harder collisions	C	B1
			collisions with walls	C	B1
			idea of collisions causing a force	C	B1
	(b)	(i)	evaporation	F	B1
		(ii)	energy of molecules increases/molecules move faster	C	B1
			molecules escape/break bonds	F	C1
			faster/higher energy molecules escape	C	<u>A1</u>
					<u>9</u>
6	(a)		resistance = voltage/current in any form, letters, words, figures, mix	F	C1
			330 6.3	2F	A1+A1
	(b)		candidate's 4 points correctly plotted ± ½ small square -1 e.e.o.o.	2F	B2
	(c)	(i)	reasonable curve, smooth, not too thick	F	B1
		(ii)	resistance/temperature changes smoothly	C	B1
	(d)	(i)	1500 - 1700 OR candidates lowest point on graph, quoted correctly	C	B1
		(ii)	idea of lowest resistance	C	<u>B1</u>
					<u>9</u>
7	(a)		(from L to R) infra red (OR μwave)/ ultra violet/ x rays/gamma rays	4F	B1 x 4
			sound ticked	F	<u>B1</u>
					<u>5</u>
8	(a)		one 90° deviation at 1st mirror, by eye	F	C1
			two 90° deviations at 1st mirror, by eye	F	A1
			emerging rays parallel to incident rays, by eye	F	B1
	(b)		upside down OR inverted OR same size OR real	C	<u>B1</u>
					<u>4</u>

9	(a)		speed = distance/time) OR speed = 2 x distance/time) in any form	F	C1
			2 x 249/332	F	C1
			1.5	F	A1
	(b)		0.75 and 2.25 ticked e.c.f. use ✓+ x = 0 for extras	2C	B1 + B1
			Mark **(b)** independent of **(a)**		5
10	(a)	(i)	conductor OR metal	F	B1
		(ii)	metal (but not if answer to **(i)**) OR any named metal OR any named liquid conductor	F	B1
		(ii)	apply an e.m.f. OR apply a p.d. OR equivalent	C	B1
	(b)	(i)	insulator NOT non-conductor (but condone as extra)	F	B1
		(ii)	any suitable example	F	B1
	(c)		insulator OR '**(b)(i)**' e.c.f. from **(b)(i)** NOT just the name of a type of insulator	F	B1
					6
11	(a)		same ticked	F	B1
	(b)		2	C	B1
	(c)		$R_1 + R_2$ in any form, letters or numbers	F	C1
			4 e.c.f. from **(b)**	C	A1
	(d)	(i)	1Ω ticked	F	B1
		(ii)	more than 0.3A ticked	C	B1
	(e)	(i)	increases/stretches	F	B1
		(ii)	increases c.a.o.	C	B1
					8
12	(a)		1 (unit) / neutral / zero / in nucleus 1/1800 (unit) OR tiny / -1 (unit) / in orbit OR outside nucleus OR $\dfrac{1}{2000}$ OR negligible NOT just negative OR in shell NOT zero	4F,2C	B1 x6
	(b)	(i)	proton <u>and</u> neutron	F	B1
		(ii)	1. 4 (units)	C	B1
			2. (+)2 (units) NOT -2	C	B1
					9

NOTES ABOUT THE 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 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 the incorrect value forward to subsequent stages of working, the candidate may be given marks indicated by e.c.f. provided the subsequent working is correct, bearing in mind the 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 <u>must</u> 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.