UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the November 2005 question paper

0625 PHYSICS

0625/03   **Paper 3 (Extended)**   **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 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*.

The minimum marks in these components needed for various grades were previously published with these mark schemes, but are now instead included in the Report on the Examination for this session.

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

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

1	(a)	force of gravity on a mass or mg	B1	
		mass/volume	B1	
	(b) (i)	hang object from spring balance, reading in N taken	B1	
		divide reading in N by 10 or g	B1	
	(iii)	volume of water in cylinder or fill overflow can to top	B1	
		add object find increase in volume or measure overflow volume	B1	[4]
		{no credit for mass unless not scored in (i) and no credit for density = mass/ volume unless not scored in a) }		
	(c) (i)	2N	B1	
		left	B1	
	(ii)	F = ma or 2 = 0.5 a	C1	
		a = 4.0 m/s^2	A1	[4] Total [10]
2	(a)	upwards force = downwards force or no resultant force	B1	
		opposing moments equal or A.C.M. = C. M.	B1	[2]
	(b)	30 x spring balance reading = 40 x 6.0 or equivalent	C1	
		spring balance reading = 8.0 N	A1	[2]
	(c)	0.5 N	B1	
		downwards	B1	[2] Total [6]
3	(a)	P = hdg or 2 x 1000 x 10	C1	
		= 20 000 N/m^2 or Pa	A1	[2]
	(b)	p = f/a or 20 000 = 50/a	C1	
		a = 0.0025 m^2	A1	[2]
	(c)	potential energy of the water	B1	
		converted to kinetic energy of water through outlet (and heat)	B1	[2] Total[6]
4	(a)	turn on heater and wait until water starts dripping in beaker	B1	
		empty beaker & replace, start watch	B1	
		stop watch & remove beaker at same time	B1	
		record time	B1	
		find and record mass of water in beaker	B1	[M4]
	(b)	60 x t = 120 x 340	C1	
		t = 680 s	A1	[2]
	(c) (i)	ice gains heat from surroundings/ice falls through funnel	B1	
	(ii)	lag or fit lid to funnel/place gauze in funnel bottom	B1	[2] Total [8]

5	(a) (i)	random	B1	
	(ii)	hit and rebound	B1	
	(b) (i)	increase or further apart	B1	
	(ii)	increase or move faster	B1	[2]
	(c) (i)	random, fast in gas to vibration in solid	B1	
	(ii)	long way apart in gas to very close or touching	B1	[2] Total [6]

6	(a)	Sound reflects off wall	B1	[1]
	(b)	400 Hz	B1	[1]
	(c)	λ = v/f or = 330/400	C1	
		= 0.83 m	A1	[2]
	(d)	vibration/oscillation along line of/direction of wave	B1	[1] Total [5]

7	(a) (i)	two approximately correct reflections	B1	
		evidence of projecting back to image or use of equal distance from the mirror, object and image	B1	
	(ii)	virtual	B1	
		any one of upright, same size, same distance from mirror	B1	[4]
	(b) (i)	ray 1 correct	B1	
		ray 2 correct	B1	
		image correctly located	B1	
	(ii)	eye symbol to right of lens	B1	[4] Total [8]

8	(a)	force is produced	B1	
		on any charge placed in the field	B1	[2]
	(b)	at least 3 parallel, straight lines plate to plate, ignore end effect	B1	
		at least one correct arrow, none wrong	B1	[2]
	(c)	q = It or 0.06 = I x 30	C1	
		I = 0.002 A or 2 mA	A1	[2]
	(d)	E = Vit	C1	
		= 1500 x 0.008 x 10	C1	
		= 120 J	A1	[3] Total [9]

9	(a)	correct symbol	B1	
		correct labels	B1	
	(b) (i)	low, OFF or 0		
	(ii)	low, OFF or 0 need both correct	B1	[1]
	(c) (i)	need 4 boxes correct for 2 marks, -1 for e.e.o.e.	B2	
	(ii)	no change	B1	[3] Total [6]
10	(a) (i)	a.c. input causes constantly changing current through coil	B1	
		magnetic field formed in or around coil	B1	
		constantly changing magnetic field	B1	[M2]
	(ii)	(changing) magnetic field transferred to secondary coil	B1	
	(iii)	(changing) magnetic field cuts secondary coil	B1	
		induces e.m.f.	B1	[3]
	(b)	more turns on secondary (than on primary)	B1	[1]
	(c)	no transfer of magnetic field from primary to secondary	B1	[1]
	(d)	Vp.Ip = Vs. Is or 100 x 0.4 = 200 x Is	C1	
		Is = 0.2 A	A1	[2] Total [9]
11	(a)	β-source and detector suitably arranged	B1	
		deflecting plates suitably arranged	B1	
		additional detail e.g. slit or collimator, vacuum chamber, circuit connected to deflecting plates	B1	[3]
	(b)	at least 3 readings at right angles beyond & perp. to the plates	M1	
		one near +ve, one near –ve and one in centre	A1	[2]
	(c)	highest reading near +ve plate	B1	[1]
	(d)	electrons negatively charged, attracted to +ve	B1	[1] Total [7]