UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2007 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 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.

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 discussions or correspondence in connection with these mark schemes.

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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.

			TARGET GRADE	MARK
1	(a)	seconds hand at 35 s	F	B1
		minutes hand at or just to R of 60 (up to ½ division)	C	B1
	(b)	seconds hand at 55 s	F	B1
		minutes hand between 4 and 5	C	B1
	(c)	4 minutes 20 s	F	B1
				[Total: 5]
2	(a)	speed = distance/time in any form OR 4800/12	F	C1
		400 (s)	F	A1
	(b)	straight line up to 12 m/s, 20s ± ½ small square	F	B1
		horizontal line for 400 s (e.c.f. for start point and from **(a)**)	F	B1
		straight line down to 0 m/s at 500 s	F	B1
	(c)	distance = ½ base x height OR area under graph OR equation of motion	F	C1
		accel. distance = 120 m	C	A1
		decel. distance = 480 m	C	A1
		NOTE: NO MARKS for using **(d)** and then going back to **(c)**		
		total distance = 120 + 4800 + 480 stated	C	A1
	(d)	average speed = total distance/total time OR 5400/500 OR 5400/920	F	C1
		10.8 (m/s) OR 11 (m/s) c.a.o.	F	A1
				[Total: 11]
3	(a) (i)	indication of force at A	F	M1
		upward vertical force OR upward force at rt. angles to card	C	A1
	(ii)	largest distance from hinge	F	B1
	(b)	when C of M lies outside base (idea of)	F	C1
		when vertical through C of M lies outside base (idea of)	C	A1
	(c) (i)	less than	F	B1
	(ii)	idea of C of M of box raised OR matchbox less stable NOT matchbox is taller	C	B1
				[Total: 7]

4	**(a)**	**(i)**	large (bird)	F	M1
		(ii)	greater weight/mass/force of gravity/heavier	F	A1
	(b)		greater	F	B1
			the same	F	B1
	(c)		small (bird)	F	B1
	(d)		lost/turned into/decreased (accept turned into KE)	F	M1
			as heat ignore mention of sound	C	A1
					[Total: 7]
5	**(a)**		solid: 2, 3 and 6 ticked -1 each error (use ✓ + × = 0 for extras)	F, C	B2
			gas: 1, 4 and 5 ticked -1 each error (use ✓ + × = 0 for extras)	F, C	B2
	(b)		molecules breaking free (of surface) NOT turns into a gas	F	M1
			mention of higher energy/faster/mols near surface	C	A1
					[Total: 6]
6	**(a)**		[mark in pairs, use ✓ + × = 0]		
			temp. decreasing	F	B1
			volume increasing	F	B1
	(b)	**(i)**	moved out/backwards/to the R	F	M1
		(ii)	idea of raised temp increases <u>pressure</u>, therefore move piston out to decrease <u>pressure</u>	C	A1
					[Total: 4]
7	**(a)**	**(i)**	(good) conductor OR equiv. NOT conductor of electricity	F	B1
		(ii)	poor conductor OR (good) insulator (allow electrical) OR to stop your hand getting burned/prevent shock	F	B1
	(b)	**(i)**	conduction	F	B1
		(ii)	any 2 of conduction, convection, radiation ticked (-1 if evaporation ticked)	F, C	B1+B1
	(c)		equal to 40W	C	B1
					[Total: 6]

8	**(a)**	50		F	B1
	(b)	his **(a)** x 4		F	C1
		200 (Hz) e.c.f.		F	A1
	(c)	Yes, because it is between 20 – 20,000 Hz or more than 20 Hz allow e.c.f. from **(b)** answer must tally with **(b)**		C	B1
			[Total: 4]		
9	**(a)**	**(i)** series OR potential divider		F	B1
		(ii) 12 (Ω)		F	B1
		(iii) I = V/R in any form		F	C1
		6/his **(ii)**		F	C1
		0.5 e.c.f.		F	A1
		A OR amp(s) OR ampere(s) OR a		F	B1
		(iv) his **(iii)** x 10		F	C1
		5 (V) e.c.f.		F	A1
		(v) his **(iv)**		C	B1
	(b)	**(i)** 1. 6 (V)		C	B1
		2. 0 (V)		C	B1
		(ii) C or clear mark positioned below A but not lower than bottom of the word contact" allow e.c.f. only if 6 and 0 in **(i)** are reversed		C	B1
			[Total: 12]		
10	**(a)**	connect wire across/to millivoltmeter (any mention of connecting to electricity/battery gets B0 here)		F	B1
		move wire across magnetic field OR move magnet past wire OR dip magnet into coil made of the wire (condone connect to battery/electricity here)		F	B1
	(b)	millivoltmeter deflects		F	B1
	(c)	generator OR transformer OR induction coil OR coil on a car OR microphone NOT relay/motor/power station etc		F	B1
			[Total: 4]		

11	**(a)**	**dot to right of S**:	horiz. line from end/pole, to right (must not curve)	F	B1
		dot to left of N:	horiz. line from end/pole, to left (must not curve)	F	B1
		dot by top LH corner:	smooth curve from end/pole, above magnet, to equivalent point at south end	F	B1
		dot below magnet:	smooth curve between N and S	F	M1
			curve leaving & entering side of magnet, not ends	C	A1
	(b)	arrow clearly indicating N to S		F	B1

[Total: 6]

12	**(a)**	**(i)**	2, 2, 0 (accept blank for 0)	F	B1
		(ii)	0, 0, 1 (accept blank for 0)	F	B1
	(b)	protons: 11		F	B1
		neutrons: 13		C	B1
		electrons: same as his protons		F	B1
	(c)	**(i)**	0	C	B1
		(ii)	-1	C	B1
		(iii)	β OR electron OR e OR B OR beta NOT b	C	B1

[Total: 8]