

CAMBRIDGE
INTERNATIONAL EXAMINATIONS

November 2003

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK: 80

SYLLABUS/COMPONENT: 0625/03

PHYSICS
Paper 3 (Extended)



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1	(a) (i)	7(.0 s)	A1		
	(ii)	PQ or 0 – 2s or other correct description	A1		
		distance = av. speed x time or area under graph	C1		
		distance $11 \times 2 \text{ m} = 22 \text{ m}$	A1	4	
	(b) (i)	deceleration (now) uniform (test 2)	B1		
		slower/lower (average) value/value between that of PQ and QR/takes longer (or values) time to come to rest.	B1		
		(ii)	deceleration = change in speed/time or $15/8$	C1	
			value = 1.9 m/s^2	A1	4
	(c) (i)	graph shows constant acceleration	B1		
		force = ma (and m is also constant) so force is constant	B1		
(ii)		towards the centre of the motion/circle	A1	3	
			[11]		
2	(a)	pressure = depth x g x density of water	C1		
		pressure = $50 \times 10 \times 1000$	C1		
		so value is $500\,000 \text{ Pa}$ or N/m^2	A1	3	
	(b)	force = pressure x area in any form	C1		
		force = $500\,000 \times 0.15 \times 0.07$	C1		
		force = 5250 N	A1	3	
			[6]		
3	(a)	one slightly nearer the centre than the other	C1		
		20 kg is the nearer one to the pivot	A1	2	
	(b)	Clockwise moments = anticlockwise moments (about point/pivot)	A1	1	
		(accept opposite directions and equal)			
	(c)	$18 \times 2.5 = 20 \times B$	C1		
		distance = 2.25 (m)	A1	2	
			[5]		
4	(a)	Some have extra/more energy than others	B1		
		most energetic leave surface/ break liquid bonds etc	B2	M2	
	(b)	evaporation occurs strictly at the surface/at all temperature	B1		
		boiling occurs throughout liquid/ at one temperature (at normal at. pr.)/ 100°C	B1	2	
	(c)	energy supplied = $Wt / 60 \times 120$	C1		
		sp.latent heat = energy/mass evaporated or $60 \times 120 / 3.2$	C1		
		value is 2250 J/g	A1	3	
			[7]		
5	(a) (i)	nitrogen	M1		
		(ii)	copper-solid-molecules very tightly bonded together so separate little	B1	
	water – liquid – molecules less tightly bonded/still small separation		B1		
	nitrogen – gas – molecules “free” and not bonded so separate most		B1	M3	
	(N.B. accept 2 bonding statements for 2 marks. 1 separation statement for 1 mark)				

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(b) (i)	size of movement/change in length of liquid column per degree	B1	
(ii)	change in length (of liquid column) same for all degrees	B1	2
			[5]
6 (a)	3 more roughly circular	B1	
	all drawn clearly circular, stop (well) clear of barrier and centred on slit	B1	
	wavelength constant throughout, both sides of barrier	B1	3
(b)	wavelength – speed/frequency in any form	C1	
	values substituted correctly	C1	
	answer $6 \times 10 \text{ m}$	A1	3
			[6]
7 (a)	two dots, marked F, each 5.0 cm from the lens	A2	2
(b)	each correct ray one mark	M2	2
(c)	correct image, labeled I	A1	1
(d)	rays pass along the axis undeviated/object distance same for all object/rays meet at same distance on image/image distance same for all image	B1	1
(e)	magnifying glass/eyepiece of telescope or microscope	B1	1
			[7]
8 (a) (i)	0-6 (V) positive and negative	A1	
(ii)	all waves roughly 6V amplitude	B1	
	3 waves approx. one wave every 0.1 s	B1	3
(b)	any mention of magnetic field	B1	
	coils (forced to) cut magnetic field	B1	
	<u>includes</u> e.m.f./voltage/current in the coils	B1	
	as in Fleming's R.H. rule	B1	M3
(c)	mechanical energy/work (in)/kinetic energy	B1	
	electrical (out) (+ heat) (ignore sound)	B1	2
			[8]
9 (a) (i)	regular (but)/not normal (sine) wave/several waves added together etc.	B1	
(ii)	1.6(V)	A1	
(iii)	connect known voltage to Y plates (without any changes to C.R.O.)	B1	
	read off against screen values	B1	4
(b) (i)	6.1 (cm) (accept 6 or any value in range 6.0 to 6.2)	A1	
(ii)	50 ms for 10 cm or 5 ms per cm e.c.f.	C1	
	so $6.1 \times 5 \text{ ms}$ or 31 ms	A1	
(iii)	difference in time of runners finishing race or other timing between two closely separated events.	B1	4
			[8]

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10 (a)	current = power/voltage or $150/12$ value is 12.5 A	C1 A1	2
(b) (i)	sum of currents at junction = current after junction/ $12.5 \text{ A} = 5.0 \text{ A} + I$ value is 7.5 A	C1 A1	
(ii)	power = VI or is 7.5×12 e.c.f from (i) value is 90 W	C1 A1	
(iii)	resistance = voltage/current or $12/7.5$ e.c.f. from (i) but not from (a) value is 1.6Ω	C1 A1	6
			[8]
11 (a)	top line correct, need 24 and 0 bottom line correct, need 12 and -1 (accept β or e for electron)	B1 B1	2
(b)	particles take curved path (accept from diagram) move between the poles at right angles to lines of force move out of paper	B1 B1 B1	3
(c) (i)	use detector to pick up <u>radiation</u> (from isotope at points on/in body etc.) high count where circulation good or v.v. explained	B1 B1	
(ii)	alpha particles all absorbed, none detected beta particles may be largely absorbed, not penetrative enough gamma rays reach detector/leave body		any two B2
			4
			[9]
			TOTAL 80