CAMBRIDGE
INTERNATIONAL EXAMINATIONS

NOVEMBER 2002

INTERNATIONAL GCSE

MARK SCHEME

MAXIMUM MARK : 60

SYLLABUS/COMPONENT : 0652/2

PHYSICAL SCIENCE (CORE)

UNIVERSITY of CAMBRIDGE
Local Examinations Syndicate

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1	(a)		Approximately correct (by eye) to mirror 2	1	
			Approximately correct (by eye) from mirror 2	1	2
			(For both marks a ruler must be used)		
	(b)		*i* correctly marked	1	1
	(c)		angle of incidence = angle of reflection (accept 'same')	1	1
	(d)		suitable suggestion	1	1
			(e.g. looking over heads at golf match, submarine, etc.)		
				Total 5	
2	(a)	(i)	decreases (not just less reactive* but accept longer time)	1	
		(ii)	decreases (not just less reactive* but accept longer time)	1	
		(iii)	increases (not just more reactive* but accept shorter time)	1	3
			*but penalise once only		
	(b)		*Test:* use of limewater	1	
			Result: goes cloudy / milky	+1	2
				Total 5	
3	(a)	(i)	acceleration, building up / increasing speed	1	
			constant / uniform	+1	
		(ii)	constant speed / accept no acceleration	1	3
	(b)		Recognition that distance travelled = area under graph		
			OR distance travelled = ½ max speed x time	1	
			insertion of correct values (½ x 10 x 3)	1	
			correct value (15)	1	3
			(Use of 10 x 3 with final answer 30 … 1 max)		
			[Calculation of total area under graph with 0 → A correct give 2 max]		
	(c)		6 m/s	1	1
				Total 7	

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4	(a)	(i)	12	1	
		(ii)	2 8 2 (all three) ecf	1	2
	(b)	(i)	copper, magnesium, sodium	1	
		(ii)	potassium, rubidium, caesium or francium (accept *correct* symbols) ANY ONE	1	
		(iii)	oxides of metals react with acids to form salts form alkali when reacts with water ANY 2	2	4
				Total 6	
5	(a)		Diagram correctly completed (voltmeter connected in parallel with incorrect component(s) 1)	2	2
	(b)	(i)	R = V/I or substitution of correct values	1	
			R = 5	1	
		(ii)	ohm or Ω	1	3
	(c)		15 (Ω) or ecf (no unit penalty)	1	1
	(d)		V = IR or correct substitution ecf	1	
			V = 12 (V)	1	2
				Total 8	
6	(a)	(i)	Na loses one electron (to form an ion)	1	
			Cl gains one electron (to form an ion) (Na gains electrons and *Cl* loses electrons give 1)	1	2
		(ii)	oppositely charged ions attract	1	
			strongly or strong bonds / forces	1	2
	(b)		add (dilute nitric acid then) aqueous silver nitrate / lead nitrate	1	
			white precipitate forms (not accept bleaching)	+1	2
				Total 6	

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7	(a)	(i)	any idea that it stops betas going straight to detector	1	
		(ii)	Geiger Mueller tube or other suitable / photographic film / solid state	1	
		(iii)	background radiation / radiation from earth or sun etc.	1	3
	(b)		use tongs to handle / do not point at anyone / lead screening / clothes NOT just protective clothes / photo film badge	1	1
	(c)		alphas very short range	1	
			air would absorb them / lose energy quickly / cause much ionisation	1	2
	(d)	(i)	mass of alphas greater than betas	1	1
		(ii)	mention of charge	1	
			on alphas opposite to betas	1	2
	(e)		no charge on gamma rays / gammas are e-m waves	1	1

Total 10

8	(a)	(i)	(12 x 20) + (1 x 42) (12 x 6 + 1x42 scores zero)	1	
			282 (ignore unit)	1	
		(ii)	$C_{21}H_{44}$	1	
		(iii)	alkane (series) not paraffins	1	
		(iv)	*test:* add bromine (water) or pot. (per) manganate (VII)	1	
			result for alkanes: no change in colour	+1	
			result for alkenes: goes colourless (not clear / transparent)	+1	7
	(b)	(i)	*1.* water (accept steam or H_2O) (1) *2.* carbon monoxide (accept CO) (1) *3.* carbon dioxide (accept CO_2) (1) *4.* carbon (not soot) (1) — Any 3	3	3
		(ii)	idea that only liquid wax will soak up the wick / fuel to keep wick burning	1	1
		(iii)	candles made from $C_{20}H_{42}$ may sag / bend / melt	1	
			C > 20 gives a higher melting point	1	2

Total 13

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