

CAMBRIDGE
INTERNATIONAL EXAMINATIONS

NOVEMBER 2002

INTERNATIONAL GCSE

MARK SCHEME
MAXIMUM MARK : 60
SYLLABUS/COMPONENT : 0652/2 PHYSICAL SCIENCE (CORE)

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

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 <i>correct</i> symbols) ANY ONE		1	
		(iii)	<u>oxides</u> 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 $R = 5$		1	
		(ii)	ohm or Ω		1	3
	(c)		15 (Ω) or ecf (no unit penalty)		1	1
	(d)		$V = IR$ or correct substitution ecf $V = 12$ (V)		1	
					1	2
					Total 8	
6	(a)	(i)	Na loses one electron (to form an ion) Cl gains one electron (to form an ion) (Na gains electrons and Cl loses electrons give 1)		1	
		(ii)	oppositely charged ions attract strongly or strong bonds / forces		1	2
	(b)		add (dilute nitric acid then) aqueous silver nitrate / lead nitrate white precipitate forms (not accept bleaching)		1	
					+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 (<u>not</u> clear / transparent)	+1	7
	(b)	(i)	1. water (accept steam or H ₂ O) (1)	} Any 3	3 3
			2. carbon monoxide (accept CO) (1)		
			3. carbon dioxide (accept CO ₂) (1)		
			4. carbon (not soot) (1)		
		(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	