CAMBRIDGE INTERNATIONAL EXAMINATIONS International General Certificate of Secondary Education

## MARK SCHEME for the October/November 2012 series

## **0652 PHYSICAL SCIENCE**

0652/32

Paper 3 (Extended Theory), maximum raw mark 80

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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, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge will not enter into discussions about these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2012 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.



	Page 2		Mark Scheme	Syllabus	Paper		
			IGCSE – October/November 2012	0652	32		
1	(a)	one extra electron added for each successive element/same number in outer shell as group number;					
	(b)	metals	s: Na, Mg, A <i>l</i> <b>and</b> <i>non-metals</i> : Si, P, S, C <i>l</i> ;		[1]		
	(c)	(i) Ca	aC <i>l</i> <sub>2</sub> ;		[1]		
		(ii) ele tw fro ato	ectrons transferred ; /o (electrons transferred) ; om (outer shell) of calcium atom, one to each (outer s oms ;	shell) of two chlorine	; [3]		
	(d)	six eleo totals c	ctrons in all three outer shells ; of eight electrons in outer shell of sulfur :				
		eight e	electrons in both oxygen outer shells after bonding ;		[3]		
					[Total: 9]		
2	(a)	the poi (max 1	int at which the whole mass of a body may be consid I mark for use of weight <b>OR</b> stating the mass is conce	ered to act ;; entrated at point)	[2]		
	(b)	(i) us = {	se of mg ∆h (= 75 × 10 × (2.3 – 1.1)) ; 900 J ;		[2]		
		<b>(ii)</b> 90	)0J;		[1]		
	(c)	use of $v^2 = 2$	$E_k = \frac{1}{2} mv^2 (750 = 0.5 \times 75 \times v^2);$ x 900/75 (= 20);				
		= 45 m	n/s ;		[3]		
	(d)	(work d	done against) friction/has KE in horizontal direction a	as well ;	[1]		
					[Total: 9]		
3	(a)	add ex (warm evapor	ccess magnesium oxide to sulfuric acid ; mixture then) filter off excess magnesium oxide ; rate solution to small volume ;				
		leave t	to crystallise then filter off crystals and dry;		[4]		
	(b)	MgO(s one ma	s) + $H_2SO_4(aq) \longrightarrow MgSO_4(aq) + H_2O(l)$ ark each for: formulae ; balance ; state symbols ;		[3]		

IGCSE - October/November 2012065232(c) relative formula massMg(OH) <sub>2</sub> = 58 ; MgSO, = 120 ; mass magnesium sulfate = $120 \times 5 + 58$ (= $10.3$ g) ;[3(d) kinetic energy ; of the air molecules ;[2](b) 30% of the input energy/power ; is converted to useful energy output ;[2](c) use of power = VI ( $4.5 \times 103 = 230$ I) ; I = $19.6$ A ;[2](d) (i) 37 ( $\pm$ 1) seconds ; (ii) all magnesium reacted ;[1](e) 24000 cm <sup>3</sup> hydrogen evolved from 24 g magnesium ; 78 cm <sup>3</sup> hydrogen evolved ; mass magnesium = $24 \times 78 \pm 24000$ ; = $0.078$ (g) ;[2](f) ine from F to centre of lens ; rays cntinue after F ; (ii) line from F to centre of lens ;[3](c) virtual, upright, enlarged ;: (all 3 correct = 2 marks; 2 correct = 1 mark)[3](c) virtual, upright, enlarged ;: (all 3 correct = 2 marks; 2 correct = 1 mark)[4]		Pa	ge 3	Mark Scheme	Syllabus	Paper
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<ul> <li>(c) virtual, upright, enlarged ;; [2 (all 3 correct = 2 marks; 2 correct = 1 mark)</li> <li>[Total: 9]</li> </ul>		(6)	ray initia rays trac	an optical centre , ally parallel to the axis passing through principal focu ced back to form the image ;	S ;	[3]
í Total: 9		(c)	virtual, ι (all 3 co	ıpright, enlarged ;; rrect = 2 marks; 2 correct = 1 mark)		[2]
				,		[Total: 9]

	Page 4		•	Mark Scheme	Syllabus	Paper
7	(a)	met in p in a	tal ha oure n Illoy d	Instal layers of atoms can slide over each other easily ; lifferent size atoms prevent easy sliding of layers ;		
	(b) (i) stee		stee	coated with layer of zinc ;		[1]
		(ii)	does	s not rust even when scratched ;		[1]
	(iii) zin rea			is more reactive than iron/steel ; ts in preference to iron/steel/idea of sacrificial corr	osion ;	[2]
	(c)	goc	od cor	nductor of heat ;		[1]
						[Total: 8]
8	(a)	(i)	vary	the resistance of <b>X</b> ;		[1]
		(ii)	use R = = 11	of gradient (= $(0.36 - 0) \div (4.0 - 0))$ or identifying sp 1/gradient or use of points ; $\Omega$ ;	ecific points ;	[3]
	(b) evidence that half diameter increases resistance ; $R = 44 \Omega$ ;					[2]
						[Total: 6]
9	(a)	has	carb	on to carbon double bond(s) ;		[1]
	<ul> <li>(b) cracking ; of alkanes ;</li> <li>(c) n H<sub>2</sub>C = CH<sub>2</sub> on left ; one mark for n ; (1 mark for an correct representation of one ethene molecule)</li> </ul>					[2]
						[2]
						[Total: 5]
10	(a)	(i)	gene conc	eration of an emf/current ; ductor in a changing magnetic field/moving through	a magnetic field ;	[2]
		(ii)	inpu a.c.	t current produces the magnetic field ; produces changing field ;		[2]
		(iii)	(soft	;) iron ;		[1]
		(iv)	easi incre	ly magnetised and demagnetised ; eases the field strength/channels the field through t	he secondary coil	; [2]

Page 5	Mark Scheme	Syllabus	Paper	
	IGCSE – October/November 2012	0652	32	
<b>(b)</b> 230 : 115	<b>(b)</b> 230 : 115 (= 2 : 1) ;			
(c) amplitud frequenc	e ≈ 1 division ; sy same as input ;		[2]	
			[Total: 10]	