

WANN, Dana Cambridge, com MARK SCHEME for the May/June 2012 question paper

for the guidance of teachers

0653 COMBINED SCIENCE

0653/23

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, which would have considered the acceptability of alternative answers.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

Cambridge is publishing the mark schemes for the May/June 2012 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

 = 25 / 2 = 12.5 (km / h); (i) chemical; [1] (ii) heating engine / heating surroundings / light / sound; [1] (iii) heating engine / heating surroundings / light / sound; [1] (iii) heating engine / heating surroundings / light / sound; [1] (iii) metal track expands in summer / hot weather; metal can expand into gap; prevents damage to tracks; [1] (ii) ethanol is renewable source / no sulfur dioxide produced; [1] (ii) 1200 (W); [1] (iii) 18; evidence of neutrons = nucleon number minus proton number; [2] (iii) 18; evidence of neutrons = nucleon number minus proton number; [2] (iii) hydrogen; [1] (b) (i) any typical metal property for X and corresponding non-metal for Y; e.g. X conductor Y insulator X malleable (ii) Y is reactive / specific example, Z is unreactive; [1] (ii) Y is reactive / specific example, Z is unreactive; [1] (iii) Y is reacts with carbon; [2] (iii) soil (too) acidic; t.m. reacts with carbon; [2] (iii) soil (too) acidic; t.m. reacts with / neutralises acid / reduces acidity; to increase fertility; [max 2] 				
 (b) (i) chemical; [1] (ii) heating engine / heating surroundings / light / sound; [1] (c) metal track expands in summer / hot weather; metal can expand into gap; prevents damage to tracks; [1] (d) ethanol is renewable source / no sulfur dioxide produced; [1] (e) (i) 5 (km/h); (accept 4 / reference to greater than 3 but equal to and less than 5) [1] (ii) 1200 (W); [1] (iii) wind speed variable / wind unreliable / owtte; [1] (iii) wind speed variable / wind unreliable / owtte; [1] (iii) 18; evidence of neutrons = nucleon number minus proton number; [2] (iii) hydrogen; [1] (b) (i) any typical metal property for X and corresponding non-metal for Y; e.g. X conductor Y insulator X malleable (ii) Y is reactive / specific example, Z is unreactive; [1] (c) (i) reference to oxygen (not air); which joins / reacts with carbon; [2] (ii) soil (too) acidic; lime, reacts with / neutralises acid / reduces acidity; to increase fertility; [max 2] 	Page 2	2		Syllabus
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 (c) (i) reference to oxygen (not air); which joins / reacts with carbon; (ii) soil (too) acidic; lime, reacts with / neutralises acid / reduces acidity; to increase fertility; 	(b) (i)	e.g. 🕽	conductor Y insulator	n-metal for Y ; [1]
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lime, reacts with / neutralises acid / reduces acidity ; to increase fertility ; [max 2]	(c) (i)			[2]
	(ii)	lime,	reacts with / neutralises acid / reduces acidity ;	[max 2]
		10 11.5	Tease terunity,	[max 2] [Total: 10]

				32
Pa	ige 3	}	Mark Scheme: Teachers' version	Syllabus 0653
(a)	only	y eats pla	IGCSE – May/June 2012 nat eats plants ; ants / does not eat meat ; o getting energy from, its food / plants ;	Syllabus 0653 [m]
(b)	eat		, more energy than they use ; bohydrate / protein, converted to fat ;	[max 2
(c)	(i)	idea tha masses		off at higher body
		use of f	figures ;	[max 2
	(ii)	insulato	or / poor conductor / reduces conduction ;	[1
(d)		bon diox thane ;	ide ;	[2
(e)	(i)	(mean)	body mass is increasing ;	[1
	(ii)	weight as sprir	ts have more time to feed (from spring onwards), during hibernation (as winters are shorter) ; ng arrives earlier, plants grow faster and as marm ive more plants to eat, therefore increasing mass	nots are herbivores
(a)	inse	ert bung	sium to acid ; ; ne for known volume of gas to collect / measure v	volume of gas at fixed
			Is / measure how long reaction lasts ;	[3
(b)	(i)	tempera	ature / surface area of magnesium ;	[1
	(ii)		r (same volume) of gas to collect is shorter ; e rate of reaction is greater ;	[2
(c)	(i)	atom, b	harged, atom is neutral / proton and electron num out differ in the ion / the atom is reactive, the ion is n shells full, while atom outer shell is not full ;	
	(ii)	MgCl ₂ ;		[1
	(iii)	hydroge	en;	[1
				[Total: 9

							2		ww.xtrapa
	Pa	ge 4		Mark S	Scheme: Teacl	hers' version		Syllabus	7.0 Y
				IG	iCSE – May/Ju	une 2012		0653	No.
5	(a)	(i)	betw	veen 10 and 20	(Hz) to betwee	en 20 000 and 2	25 000 (Hz	<u>:</u>);	an
		(ii)				duced / passing onsecutive, pea		er second; ns;	www.ktrapa
	(b)	(i)	need	ls, air / particle	s / a medium ;				
		(ii)	quie	ter / lower volu	me ;				
		(iii)	micr	owaves;					
	(c)			incidence label					
		ang	le of	refraction label	led ;				
									[Tota
	(a)	labe	el to r	oot hair cell ;					
	(b)		erals	/ ions / named o different mine	mineral ion ; eral ions for 2 r	narks)			
	(c)	(i)	xyler	n ;					
		(ii)	A in	central area of	root ;				

(d) (i)

structure	plant cells	animal cells
cell membrane	1	\checkmark
cell wall	\checkmark	×
nucleus	\checkmark	\checkmark
vacuole containing sap	✓	×

1 mark for any row correct ;;;;

[4]

[1]

(ii) no, as they do not get light / as they are underground ;

[Total: 10]

Pag	e 5	Mark Scheme: Teachers' versionSyllabusIGCSE – May/June 20120653	apa
(a)		ammeter in series with lamp ; voltmeter in parallel with lamp ; variable resistor in series with lamp and all else correct ;	baba Cambrid
(ii)	to change, voltage across / current through, lamp / in circuit ;	[1]
(b)	(i)	positive and negative ;	[1]
(ii)	electrons ;	[1]
(i	ii)	metal / named metal / graphite ;	[1]
			[Total: 7]
(a)	(i)	nitrogen 78% oxygen 21% others 1% ;; (all correct 2, two correct 1)	[2]
(ii)	carbon dioxide / water (vapour) / any noble gas ;	[1]
(b) ((i)	<i>elements</i> all atoms have same proton number / are found in Periodic Table / cannot be broken down into anything simpler ; <i>compounds</i> contain different types of atom / elements (bonded) ;	e [2]
(ii)	covalent ;	
(i	ii)	bonded elements are both non-metals / compounds are gases ; pure water is neutral ; rain water (generally) is (more) acidic (than pure water) ; rainwater during thunderstorm is the most acidic / owtte ; likely to be caused by nitrogen oxides ;	[2]
		which have reacted with the rain to form an acid ;	[max 2]
(a) r	nutr	ition	[Total: 9]
e r r ç	excr resp repr grov	retion Diration roduction	
((1 m	nark for any two correct) ;;	[max 2]
(b)	(i)	adrenaline ;	[1]
(ii)	increases pulse rate ; increases blood pressure ; increases glucose in blood ;	[max 2]
(c) i	n th	ne blood / blood vessels ;	[1]
			[Total: 6]