## MARK SCHEME for the May/June 2007 question paper

## 0653 COMBINED SCIENCE

0653/03

Paper 3 (Extended 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.

All Examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

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

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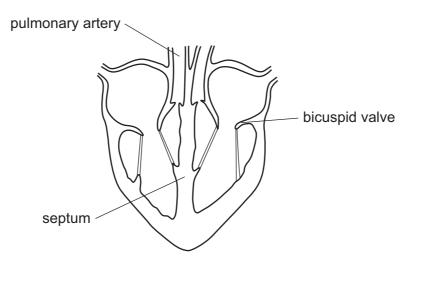


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1 (a) one mark for each correct label;;;

2



[3]

(b) contains more muscle; to provide, more force / high(er) pressure ; to push blood further round the body; right ventricle only pushes blood to lungs ; [max 2] (c) aorta wall is thicker ; aorta lumen is smaller ; aorta wall is more elastic ; vein has valves; [max 2] (d) <u>muscle</u> does not get oxygen ; so cannot respire ; so cannot contract ; [max 2] (a)  $A_2 = 0.015 A$  $A_3 = 0.15 A;$ **V**<sub>1</sub> = 3 V ;  $V_2 = 3 V;$ [2] (b) (i) Vp/Vs = Np/Ns; (or rearranged) 25 000 / 400 000 = 20 000 / Ns ; (or alternative working method) (Ns) = 320 000 ; [3] (ii) changing current causes changing magnetic field ; changing magnetic field induces voltage in secondary coil; [2]

	Ра	ge 3		Mark Scheme			S	yllabus		Paper				
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3	(a)	in mixture: (particles / molecules) of the different gases are not bonded / gases have the same (chemical) properties as when not mixed / any proportions are possible / can be separated by physical methods ;							[1]					
	(b)	(i)		oon m oon / s		e / stea	ım ;							[2]
		(ii)	goes	s clou	h limev dy ; rbon di									
			goes		n, blue <sup>-</sup>		e (pape / white		•	copper s	ulfate ;			[max 4]
	(c)	(i)	KOF	┨;										[1]
		(ii)	H⁺ +	- OH <sup>-</sup>		H₂O ;	; (left h	and sic	le and r	ight hand	d side)			[2]
4	(a)		-			ainfore gures o	est ; quoted ;							[2]
	(b)	14 s	pecie	es foi	und <u>onl</u>	<u>y</u> in the	e rainfor	est ;						[1]
	(c)	polli ref.	natio to fer	on;(ı rtilisat	not 'pol tion foll	owing p	·; persed'; pollinati n / pollir	on ;						[max 2]
	(d)	mor less	e roo run-	ots to	soak u	ground o the w	l directly vater ;	/;						[max 2]
	(e)	(i)	com	parec	d with, f	he con	of pods trol / no / elimina	treatm	ient ;	use of fig	ures ;			[max 2]
		(ii)					ungus to jestion (			irticular s	stage of	the curv	e);	[2]

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5	(a)	(i)	<b>B</b> be	ecause the line is horizontal ;		[1]		
		(ii)		nge of speed = 0 to 28 s / a = (v-u)/ t ; m/s <sup>2</sup> ;		[2]		
		(iii)		e = mass x acceleration ; 00 x 1.4 = 1960 N ;		[2]		
		(iv)		[2]				
	(b)	(i)	road	material expands when hot ;		[1]		
		(ii)		[1]				
	(c)	(les	s) ex	planation relating to resistances in parallel ;		[1]		
6	(a)	any group 1 or calcium / strontium / barium ; reference to hydrogen ; (only) these metals produce hydrogen (rapidly) / at room temp / in cold water, when they react with water ; [3]						
	(b)	(i)	oxid	ation / redox ;		[1]		
		(ii)	rust	gen / water / substances from the air, have reacted v is (hydrated) iron oxide ; to the combined mass of iron and other substances		; [max 2]		
7	(a)	sim	ilar sl	nape with optimum at lower temperature ;		[1]		
	(b)	moi	re fre	erature rises (below optimum) movement of molecul quent collisions / more energetic collisions ; enzyme and substrate ;	es increases ;			
		beyond optimum enzymes denature ; they are proteins ; lose their shape at high temperatures ;						
	(c)	plar	nt cel	ls at lower temperatures / plant enzymes work bette	r where they live ;	[1]		

	Ра	ge 5		Mark Scheme	Syllabus	Paper					
				IGCSE – May/June 2007	0653	03					
8	(a)	(i)	infra	-red / microwaves ;		[1]					
		(ii)	300	300 000 000 m/s ;							
		(iii)	frequ	frequency / wavelength ;							
	(b)	(i)	brea	breakdown of an (unstable) nucleus ;							
		(ii)	Geig	ger-Müller tube ;		[1]					
		(iii)	mov mov unaf		[3]						
		(iv)	cano skin	ages cells or DNA or mutates ;		[max 2]					
9	(a)	(i)	brom	nine ;		[1]					
		(ii)	enat	rm an electrolyte / to melt the lead bromide ; bles <u>ions</u> to move ; nat an electric current will flow through it ;		[max 2]					
	(b)	(i)	+2; two ·	-1 bromide ions balance the charge on the lead ion	;	[2]					
		(ii)	```	because bromine atom has 35 electrons / same numb gained one electron / has single negative charge so							
	(c)	(i)		ed pair ; ther non-bonding electrons shown ;		[2]					
		(ii)	Si +	$2Cl_2 \longrightarrow SiCl_4$ ; ; (formula and balanced)		[2]					