UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

International General Certificate of Secondary Education

MARK SCHEME for the May/June 2011 question paper

for the guidance of teachers

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0608 TWENTY FIRST CENTURY SCIENCE

0608/03 Paper 3 (Core Written), maximum raw mark 60

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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 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 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

Question			Expected Answers	Mks	Additional Guidance
1	**(a)**		tick against nitrogen dioxide (1) tick against sulfur dioxide (1) nitrogen dioxide source: car exhaust (1) sulfur dioxide source: power stations (1)	[4]	if 3 ticks = max 1 mark if 4 or more ticks = no marks ignore sources of other gases
	(b)	**(i)**	increases <u>and</u> increases (1)	[1]	allow alternative wording, e.g. goes up allow decreases <u>and</u> decreases
		(ii)	results can be repeated (by other scientists)/ more data can be obtained (1)	[1]	allow causal link found
	(c)		second nitrogen monoxide molecule on left (1) two carbon dioxide molecules on right (1)	[2]	
			Total	**[8]**	
2	**(a)**	**(i)**	it is an outlier/it is far from the other values (1) it would make the mean a poorer best estimate/it would make a big change to the value of the mean/alternative wording (1)	[2]	
		(ii)	(22 + 21 + 20 + 22 + 24 + 23)/6 (1) = 22 (1)	[2]	
		(iii)	20 to 24 (1)	[1]	
	(b)		make chains longer/add cross linking (1)	[1]	allow increased crystallinity
			Total	**[6]**	
3	**(a)**	**(i)**	pesticide residue left on food (after spraying) (1)	[1]	
		(ii)	additives added during processing of food (1)	[1]	
		(iii)	mould grows on food in storage (and produces toxic chemicals) (1)	[1]	
	(b)		they carry out risk assessments (1) to find the safe levels of chemicals in food (1)	[2]	
	(c)		buy organic food/check food labels (1)	[1]	
			Total	**[6]**	

4	(a)		*telescope on Earth affected by:* light pollution (1) clouds (1) atmospheric distortion (1)	[2]	any two points
	(b)		for: find life on other planets (1) against: any identified project (1)	[2]	e.g. food provision, curing AIDS, solving global warming
	(c)		(clouds of) gas (1) and dust (1) over long periods of time (condensed under gravity) (1)	[2]	any two points
	(d)	(i)	distance light travels in a year (1)	[1]	
		(ii)	numbers/values will be too big (1)	[1]	
			Total	**[8]**	
5	(a)		380 (microsieverts) (1)	[1]	
	(b)		370 + 800 + 380 + 310 + 500 = 2360 μSv (1)	[1]	
	(c)		calculates 800 divided by own answer to b or compares 800 to ½ of own answer to **(b)** (1) draws appropriate conclusion (1)	[2]	correct total in **(b)** gives the answer "not true"
	(d)		test: see which is more penetrating/can go through paper/card/something fairly thin (1) result: alpha is absorbed readily (1)	[2]	allow other valid tests
			Total	**[6]**	
6	(a)	(i)	photons (1) X rays (1)	[2]	
		(ii)	ozone (1)	[1]	
	(b)	(i)	damage cells/cause (skin) cancer (1)	[1]	allow sunburn
		(ii)	feel/look good/produces vitamin D/enjoy it/like having a tan (1)	[1]	
		(iii)	put on sunblock/cover up with cotton clothing <u>because</u> it absorbs/reflects UV	[1]	
			Total	**[6]**	

7	(a)		male: XY (1) female: XX (1)	[2]	

	(b)		description term
			             allele
			contains only one copy of each chromosome from each pair
			             chromosome
			instructions for a cell that describe how to make proteins
			             gene
			there are 23 pairs of these in each human body cell
			             nucleus
			a different version of the same gene
			             sex cell
				[4]	one mark for each correct line
					any description box with two or more lines from it = no mark

	(c)	(i)	to see if he will develop the condition (1) to see if he could pass on the condition to his children (1)	[2]	
		(ii)	may cause him stress / may cause him to become depressed / may affect his mental health / it is an invasion of privacy / he may have problems getting life insurance / the test may give a false positive result (1)	[1]	
			Total	**[9]**	
8	(a)		poor diet (1) stress (1) cigarette smoking (1) excess alcohol intake (1) high saturated fat intake (1) high salt intake (1) lack of exercise (1)	[2]	any two
	(b)	(i)	factor: air pollution (1) outcome: heart disease (1)	[2]	
		(ii)	any correct correlation (1)	[1]	must describe direction
		(iii)	peer review (1)	[1]	
		(iv)	because other scientists need to evaluate the study (1)	[1]	if more than one tick = no marks
			Total	**[7]**	

9	(a)		sun (1)	[1]	
	(b)		horseshoe crab **and** diamondback terrapin (1)	[1]	
	(c)	(i)	all (individuals of species) have died out (1)	[1]	
		(ii)	increase **and** more (1)	[1]	
			Total	**[4]**	