MARK SCHEME for the May/June 2013 series

0608 TWENTY FIRST CENTURY SCIENCE

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

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 May/June 2013 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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Question	Expected Answers	Mks	Additional Guidance
1 (a) (i)	10 to 120;	[1]	allow 120 to 10
(ii)	8 16;	[1]	both required
(iii)	more cars driving in town at these times; people going to and from work;	[2]	
(b)	air/atmosphere;	[1]	
(c)	carbon monoxide;	[1]	allow carbon dioxide nitrogen dioxide, nitrogen monoxide, hydrocarbons, benzene,
	Total	**[6]**	
2 (a)	(13+11+12+13+14+12)/6; = 12.5	[2]	allow 75/6
(b) (i)	makes it stretch more;	[1]	do not allow more flexible/more elastic
(ii)	plasticiser gets between polymer molecules; forces are lower; molecules/chains slide over each other more easily;	[3]	
(c)	unplasticised because more durable; OR plasticised because will be more comfortable/easier to move in;	[1]	allow any reasonable answer that clearly links to properties
	Total	**[7]**	
3 (a)	glucose; amino acids;	[2]	
(b)	any correct food type eg fat; matching health problem eg obesity;	[2]	reject sugar/fast food accept salt/alcohol
(c) (i)	look on label for food type they are trying to avoid / compare labels on different products; eat less of/do not eat if food type is listed / eat product with less;	[2]	allow answers that use examples e.g. sugar/fat
(ii)	do not think it will happen to them / do not care / think risk is small / not aware or the risk / benefit outweighs the risk;	1	allow any reasonable answer
	Total	**[7]**	

Question	Expected Answers	Mks	Additional Guidance
4 **(a)** **(i)**	asteroids are: smaller / not spherical / mostly found between Mars and Jupiter or planets are: bigger / have moons / have atmospheres (mostly);	[1]	any point in either list as long as it is clear to which category it refers, e.g. not 'They are bigger'.
(ii)	asteroids are: mostly found between Mars and Jupiter / rocky or comets: are icy dust / have tails/ have very elliptical orbits	[1]	any point. NOT size difference
(b) **(i)**	(huge) clouds of dust created; block out Sun / cool Earth / disrupt climate / no food;	[2]	1st mark for dust, 2nd mark for consequence
(ii)	Any two from: gives independent evidence of large asteroid impact; shows that time of asteroid impact fits with time of extinction; this observation increases confidence in the asteroid impact theory;	[2]	
	Total	**6**	
5 **(a)** **(i)**	3 correctly plotted points = (2) 2 correctly plotted points = (1)	[2]	
(ii)	temperature increases with time;	[1]	allow 'temperature fluctuates a lot'
(b) **(i)**	carbon dioxide;	[1]	
(ii)	burning fossil fuels; burning forests to clear land;	[2]	accept any valid examples
(iii)	severe flooding/rise of sea level would mean people would lose their land; vastly increased rain or drought would prevent growth of food crops;	[2]	
	Total	**[8]**	

Question	Expected Answers	Mks	Additional Guidance
6 (a)	alpha, beta, gamma / α, β, γ	[2]	3 correct names = (1); correct order for 2nd mark
(b) (i)	10(%);	[1]	
(ii)	24 (thousand years);	[1]	accept 24 000 in space
(c) (i)	benefit: employment / revenue from tax / use of local facilities;	[1]	allow any reasonable suggestion.
(ii)	risk reduction: strict regular inspections / regulations about handling materials / secure containment at all stages;	[1]	allow any reasonable suggestion inc reduction of risk to workers.
	Total	**[6]**	
7 (a)	white (blood) cell;	[1]	
(b)	to protect baby from microorganisms/diseases;	[1]	accept newborn cannot make antibodies
(c)	different antibodies are needed to recognise each microorganism/fight each disease;	[1]	
(d) (i)	injection; of safe form of disease causing microorganism; causes body to produce antibodies before infection;	[2]	accept oral vaccination any two
(ii)	won't be able to produce antibodies;	[1]	
(iii)	reduces cases of disease / less cost to government or medical profession / healthier population;	[1]	accept any reasonable idea
(iv)	risk of side effects /painful /ethical issues i.e. don't believe in vaccinations;	[1]	accept do not understand/cannot afford vaccination
	Total:	**[8]**	

Question	Expected Answers	Mks	Additional Guidance
8 (a)	<table><tr><td>nervous</td><td>hormonal</td></tr><tr><td>B C D</td><td>A E</td></tr></table>	[2]	all 5 correct = 2 marks 4 or 3 correct = 1 mark
(b)	nervous system: electrical impulses / via neurones / faster responses / shorter lived responses / hormonal: chemical messages / via bloodstream / slower responses / longer lived responses /	[2]	differences must be clearly comparative, i.e. 'fast**er** impulses in nerves' = 1 mark. Equally 'nervous impulses are electrical whereas hormones are chemical' = 1 mark. No mark for 'nervous impulses are fast'. Unless coupled with 'Hormonal are slow'
(c) (i)	brain; spinal cord;	[2]	either order
(ii)	faster impulses in vertebrates; some correct data quoted to support conclusion;	[2]	accept ora ignore units
	Total:	**[8]**	
9 (a)	stem cells are unspecialised cells; can develop into any type of cell;	[2]	
(b)	Any two from: unnatural/unethical; uses cells from embryos; embryos only produced to create stem cells; unused embryos are discarded; involves risk/may have side effects;	[2]	
	Total:	**[4]**	