

MARK SCHEME for the October/November 2012 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.

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Question	Expected Answers	Mks	Additional Guidance
1 (a)	T F F T	[2]	all correct = 2 marks 3 correct = 1 mark
(b) (i)	to see if he has the disease / to see if he is a carrier for the disease / to make decisions about whether he has children (1)	[1]	
(ii)	<i>any two from:</i> results could be incorrect (1) test could be stressful (1) test could be painful (1) invasion of privacy (1) people have the right to choose whether they undergo tests themselves (1)	[2]	allow ref to possible discrimination by the employer (1)
	Total	[5]	
2 (a)	muscle oxygen arteries	[2]	all correct = 2 marks 2 correct = 1 mark
(b) (i)	75 (1) 6 (1)	[2]	
(ii)	Increases	[1]	
(iii)	as mean body mass of the population increases, the percentage of people in the population suffering from heart disease increases (1)	[1]	
(iv)	smoking / amount of fat in diet / amount of salt in diet / alcohol (1)	[1]	
	Total	[7]	

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3 (a)	<i>any two from:</i> alternative views of creation (by God) were very established (1) contravened an established model of creation (1) required the Earth to be much older than was thought possible (1) could not show evolution taking place (1) not enough evidence (1) mechanism (genes) not then known (1)	[2]	
(b) (i)	natural selection	[1]	do not allow evolution
(ii)	(A) E C B D	[3]	for each mark, look for: E before C C before B B before D
(c)	<i>any two from:</i> two organisms with desirable characteristics selected (1) bred together by humans (1) to produce offspring with same or improved characteristics (1)	[2]	
	Total	[8]	
4 (a) (i)	it is an outlier / it is far lower than the others	[1]	
(ii)	$(5.7 + 5.6 + 5.5 + 5.6 + 5.8 + 5.4)/6$ or $33.6/6(1)$ $= 5.6 (1)$	[2]	correct answer = 2 marks allow 33.6/6
(b) (i)	sulfur in coal burns to form sulfur dioxide (1) sulfur dioxide reacts with water (and oxygen) to form acid rain/sulfuric acid (1)	[2]	
(ii)	nitrogen dioxide (1) from car engines/exhaust (1)	[2]	
	Total	[7]	

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5	(a)	(i)	it can be separated into fractions	[1]	
		(ii)	different sizes/chain lengths/different number of atoms	[1]	
		(iii)	it has chlorine (atoms)	[1]	
	(b)	(i)	makes polymer softer/more flexible	[1]	allow lowers melting point
		(ii)	between reduces easier	[2]	all correct = 2 marks 2 correct = 1 mark
			Total	[6]	
6	(a)		crop takes nitrogen/nutrients from ground (1) when crop is harvested these are taken away / these are not returned (1)	[2]	allow minerals/ phosphorus/potassium
	(b)	(i)	they are made from crude oil (fractions) (1) crude oil is not renewable (1)	[2]	allow the idea of using energy from oil/using natural gas
		(ii)	<i>any two from:</i> animal waste is used as a fertiliser (1) crops can be rotated (1) legumes can be grown (1)	[2]	
		(iii)	pests / disease	[1]	
			Total	[7]	

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7 (a)	millions/lots of (1) stars (1)	[2]	
(b) (i)	V increases with d (1) (direct) proportion (1)	[2]	allow positive correlation accept idea that it is linear
(ii)	points scattered about line (1)	[1]	
(iii)	14 (thousand million years ago)	[1]	allow 13.7
	Total	[6]	
8 (a)	absorbed emitted absorbed	[2]	all correct = 2 marks 1 or 2 correct = 1 mark
(b) (i)	<i>any one from:</i> burning carbon fuels / fossil fuels (1) deforestation (1)	[1]	
(ii)	climate change/food shortage/extreme weather conditions/flooding	[1]	
(c) (i)	need ozone layer to protect us / ref to role of ozone in UV absorption (1) as ozone damages skin / causes skin cancer (1)	[2]	
(ii)	people who manufacture/trade in refrigerators or aerosol sprays or CFCs	[1]	
	Total	[7]	
9 (a)	nuclear reactor (1) generator (1)	[2]	
(b)	nuclear waste/risk if there should be an accident (1) CO ₂ produced / other pollutants e.g. SO ₂ / dwindling resource (1)	[2]	
(c) (i)	need to supply very much more coal/lot to transport and burn (1)	[1]	
(ii)	$12/36 \times 100$ (1) = 33.3 (1)	[2]	correct answer = 2 marks
	Total	[7]	