

Mark Scheme for June 2012

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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 should be read in conjunction with the published question papers and the report on the examination.

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Annotations

Annotation	Meaning
	Correct response
	Incorrect response
	Benefit of doubt
	Benefit of the doubt not given
	error carried forward
	Omission Mark
	Ignore
	Reject
	Contradiction

Subject-specific Marking Instructions

/	alternative and acceptable answers for the same marking point
(1)	separates marking points
allow	answers that can be accepted
not	answers which are not worthy of credit
reject	answers which are not worthy of credit
ignore	statements which are irrelevant
()	words which are not essential to gain credit
<u> </u>	underlined words must be present in answer to score a mark (although not correctly spelt unless otherwise stated)
ecf	error carried forward
AW	alternate wording
ora	or reverse argument

Question		Expected Answers	Marks	Additional Guidance	
1	(a)	oxygen (1)	1	allow correct formula	
	(b)	<p>any two from: (muscles are) working harder / need more energy / respiring faster (1)</p> <p>to get more oxygen (to the muscle) (1)</p> <p>more carbon dioxide (made by the muscles) is removed or carbon dioxide (made by the muscles) is removed more quickly (1)</p>	2	<p>if no mention of muscle max mark = 1 allow less oxygen in the atmosphere (1) ignore lots of energy</p> <p>allow muscle needs more oxygen</p> <p>ignore references to heart rate / blood / oxygen debt</p>	
	(c)	(i)	sweating (1)	1	allow breathing / radiation ignore vasodilation
		(ii)	tick in 3 rd box / High body temperature can cause dehydration (1)	1	
	(d)	(i)	pancreas (1)	1	
		(ii)	sugar / glucose (1)	1	
			Total	7	

Question		Expected Answers	Marks	Additional Guidance
2	(a)	nucleus (1) change (1) recessive (1)	3	allow transformation / alteration / defect / error not mutated
	(b)	tick in 1 st box / earlobe shape (1)	1	
Total			4	

Question		Expected Answers	Marks	Additional Guidance
3	(a)	any two from: binocular vision: uses two eyes (to focus / look at an object) (1) has a better judgement of distance(1) gives the perception of depth / 3D (1) has a smaller field of view (1) has forward facing eyes (1) monocular vision: uses one eye (to focus / look at an object) (1) has a poor judgement of distance (1) has poor depth perception (1) has a wider field of view (1) has eyes on the side of the head (1)	2	Answers must be correctly linked to binocular / monocular eg binocular uses two eyes = 1 eg uses two eyes = 0 ignore you can see a greater distance / further
	(b)	iris (1)	1	allow iris labelled on the diagram
	(c)	let in more light / hunt at night / see in the dark (1)	1	ignore general references to just seeing better ignore nocturnal alone eg they are nocturnal = 0 eg they are nocturnal hunters = 1
Total			4	

Question			Expected Answers	Marks	Additional Guidance
4	(a)	(i)	growth / repair (1)	1	allow make enzymes / proteins / build muscle / emergency energy source ignore keep healthy / for energy
		(ii)	52.5 (1)	1	allow 53 but not 52
	(b)	(i)	higher (no mark) because she is shorter (1) but has the same mass (1) Or because her BMI is 24.22 (2)	2	ignore smaller allow weight for mass allow reverse argument allow 24.2 but 24.221 etc / 24.20 = (1) if answer is lower then maximum of one mark
		(ii)	lack of exercise / does not play sport (1)	1	allow reference to high fat diet ignore references to height / weight / mass / being unfit
			Total	5	

Question		Expected Answers	Marks	Additional Guidance	
5	(a)	white fur (1) thick fur (1) thick layer of fat (1) large size (1) small ears (1) large feet / large paws (1) hair on soles of feet (1) sharp claws (1)	2	accept white coat accept thick coat allow blubber ignore reference to teeth allow black skin (1)	
	(b)	population rises <u>and</u> falls (1) any two factors affecting population size: hunting / legal protection / education programmes (1) food availability (1) habitat destruction / ice caps melting / climate change (1)	3	max 2 if no factor correctly linked to population changes ignore no food ignore global warming allow 1 mark for the idea that population estimates have become more accurate	
	(c)	(i)	(a plant or animal) in danger of becoming extinct (1)	1	allow about to die out / dying out / numbers dropping too low / not many of them left (1) ignore animal or plant will die ignore numbers going down / dying unless qualified
		(ii)	carbon dioxide (1)	1	allow methane / water vapour / CFCs not carbon monoxide / sulfur dioxide allow correct formula ignore just water / greenhouse gas(es) / carbon emissions
			Total	7	

Question		Expected Answers	Marks	Additional Guidance
6	(a)	photosynthesis (1) oxygen (1) starch (1)	3	
	(b)	(i) idea of replacing the resources as they are used eg growing plants that can be replenished after being used (1)	1	allow never run out not can be used again
		(ii) fish (stocks) / biofuels / composting (1)	1	allow wind / solar / water ignore wood / woodland
	(c)	sulfur dioxide / acid rain (1)	1	allow correct formula allow carbon dioxide / nitrogen oxides
		Total	6	

Question		Expected Answers	Marks	Additional Guidance										
7	(a)	<table border="1"> <tr> <td>A</td> <td>Wireworm</td> </tr> <tr> <td>B</td> <td>Aphid</td> </tr> <tr> <td>C</td> <td>Long horn beetle</td> </tr> <tr> <td>D</td> <td>Leaf beetle</td> </tr> <tr> <td>E</td> <td>Flea beetle</td> </tr> </table>	A	Wireworm	B	Aphid	C	Long horn beetle	D	Leaf beetle	E	Flea beetle	2	all correct 2 marks four or three correct 1 mark
A	Wireworm													
B	Aphid													
C	Long horn beetle													
D	Leaf beetle													
E	Flea beetle													
	(b)	(i)	48 (2) but $\frac{120}{10}$ (1) 12×4 (1) 120×4 (1) $0.25 \times 4 = 1$ (1) $1 / 0.25 = 4$ (1)	2										
		(ii)	153600 (1)	1	allow ecf ie (b)(i) x 3200									

Question			Expected Answers	Marks	Additional Guidance
	(c)		<p>It would go down (no mark)</p> <p>any two from: there is competition (1)</p> <p>grasshoppers eat more grass / leaf beetles have less grass (1)</p> <p>grasshoppers eat the grass before the leaf beetles / grasshoppers eat the grass quicker than the leaf beetles (1)</p>	2	<p>It would go up = 0</p> <p>allow food as an alternative to grass</p> <p>allow food as an alternative to grass</p>
			Total	7	

Question			Expected Answers	Marks	Additional Guidance
8	(a)	(i)	<p>infancy (1)</p> <p>childhood (1)</p>	2	<p>any order</p> <p>allow infant</p> <p>allow child</p>
		(ii)	1 and 2 (1)	1	
	(b)		differentiation (1)	1	allow answer circled / underlined
	(c)		to carry / transport oxygen (1)	1	ignore just oxygen
			Total	5	

Question		Expected Answers	Marks	Additional Guidance
10	(a)	0.6 (1)	1	
	(b)	(i) 2.9 (1)	1	allow 50 °C and 3 rd attempt
		(ii) any one from: some gas escaped from the tube / tube not fitted tightly (1) temperature was too high (1) not enough / too dilute hydrogen peroxide (1) not enough yeast (1)	1	not just wrong temperature ignore yeast denatured / enzymes killed not just wrong amount not just wrong amount
		Total	3	

Question		Expected Answers	Marks	Additional Guidance
11	(a)	lungs (1)	1	
	(b)	sperm (cell) (1)	1	
	(c)	any one from: defend against disease (1) make / release antibodies (1) destroy / kill / engulf pathogens (1)	1	allow protect against disease / infection / pathogens allow destroy bacteria / micro-organisms ignore fight bacteria / fight pathogens / fight infection not germs
	(d)	artery (1)	1	allow pulmonary artery
		Total	4	

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