

Biology B

General Certificate of Secondary Education **B632/02**

Unit 2: Modules B4, B5, B6

Mark Scheme for June 2010

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Any enquiries about publications should be addressed to:

OCR Publications
PO Box 5050
Annesley
NOTTINGHAM
NG15 0DL

Telephone: 0870 770 6622
Facsimile: 01223 552610
E-mail: publications@ocr.org.uk

Question		Expected Answers	Marks	Additional Guidance
1	(a)	the rate of decay increases if there is a larger surface area for the decomposers to feed on (1)	1	more than one tick no mark
	(b)	any two from: secrete enzymes externally / digest food externally / extracellular digestion (1) absorb digested AW food (1)	2	ignore excrete ignore absorb digested bits/pieces ignore unqualified food/nutrients ignore digested minerals/vitamins
	(c)	any one from: kills bacteria / mould / fungi / microbes / decomposers / saprophytes (1) stops oxygen / air / gasses getting to fruit (1)	1	allow sterilizes fruit ignore germs allow stop microbes getting in
		Total	4	

Question		Expected Answers	Marks	Additional Guidance
2	(a)	<p>(advantage) animals not kept in cramped conditions / no chemicals in meat produced / less maintenance of pens (1)</p> <p>(disadvantage) more energy 'lost' (to environment) / less efficient / more diseases amongst pigs (1)</p>	2	<p>do not allow converse argument for second mark maximum 1 mark for advantage and 1 mark for disadvantage allow ethical reasons eg less cruel / treated well ignore more natural environment / no chemicals affecting the environment / better quality of life / better quality of product</p> <p>allow more labour intensive / more land needed / cannot use antibiotics / more difficult to control disease / lower yield or produce / smaller pigs / fewer pigs / less meat / greater chance of predation</p>
	(b)	roots and leaves (1)	1	more than one tick no mark
	(c) (i)	<u>yellow</u> (1)	1	more than one colour no mark
	(ii)	<u>chlorophyll</u> (1)	1	ignore chloroplasts
Total			5	

Question			Expected Answers	Marks	Additional Guidance
3	(a)	(i)	xylem (1)	1	not phloem ignore vessels
		(ii)	any one from: hollow / lumen / tubular / strengthened / thick (cellulose cell) walls (1)	1	allow cell walls contain lignin allow column of cells joined with open ends ignore dead not live cells
	(b)		increase in wind speed / lower humidity / increase in temperature (1)	1	must be comparative allow windy ignore wind allow gets drier ignore reference to rain ignore dryness ignore warmth / heat / temperature
	(c)	(i)	<u>spongy mesophyll</u> (1)	1	
		(ii)	air spaces allow diffusion AW (between cells and stomata) / cells have thin walls (1)	1	allow large surface area / moist / short diffusion pathway ignore gas exchange ignore it/the layer is thin
			Total	5	

Question		Expected Answers	Marks	Additional Guidance
4	(a)	both bars drawn correctly (1) cricket and bird labelled (1)	2	ignore asymmetry cricket = 5 squares +/- ½ square bird = must be less than one square allow if bird bar is one square wide but not as high as producer bar
	(b)	heat / respiration / egestion / excretion (1)	1	not growth / repair allow in faeces / urine / not all parts eaten / movement ignore waste / death allow any process that involves movement
	(c)	40 (1)	1	not 0.4
	(d) (i)	photosynthesis (1)	1	
	(ii)	chemical weathering / acid rain / volcanic eruption (1)	1	allow heat it / add acid / thermal decomposition ignore combust / burn / decay / erosion ignore weathering unqualified
		Total	6	

Question		Expected Answers	Marks	Additional Guidance	
5	(a)	<p>any three from: homeostasis ideas: regulate water loss / control blood concentration / removes excess water / removes excess salts (1)</p> <p>filter blood (1)</p> <p>(at high) pressure (1)</p> <p>re-absorb water / useful substances (1)</p> <p>remove urea / waste products from blood (1)</p> <p>make urine (1)</p>	3	<p>ignore filter fluids</p> <p>allow 'ultrafiltration' = 2</p> <p>allow named examples eg sugar / amino acids / salts</p> <p>ignore clean blood / remove waste from body</p> <p>ignore excretes urine</p>	
	(b)	(i)	<p>two from:</p> <p>tissue match / same DNA / same blood group / same genes(1)</p> <p>same / similar size / same age (1)</p> <p>he knows his brother's health / lifestyle (1)</p> <p>avoids waiting lists (1)</p>	2	<p>allow not rejected / will not need so many anti rejection drugs but</p> <p>ignore similar</p>
		(ii)	(kidney machines are) too big (1)	1	
Total			6		

Question		Expected Answers	Marks	Additional Guidance				
6	(a)	max two from: (tidal vol =) 0.6 (litres) (1) (vital capacity =) 3.6 (litres) (1) BUT 6 (3)	3	correct answer, no working = 3				
	(b)	volume increases and pressure decreases (1) <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 25%;">✓</td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> <td style="width: 25%;">✓</td> </tr> </table>	✓			✓	1	both ticks needed for the one mark more than two ticks = 0
✓			✓					
	(c) (i)	(cartilage) replaced by calcium / phosphorus (1)	1	allow mineralisation ignore joins with minerals ignore phosphates				
	(ii)	(makes them) stronger (1)	1	must be comparative ignore just 'strong' allow better protection (for internal organs)				
	(iii)	flexibility / movement (1)	1	allow for breathing allow for growing allow less brittle ignore repair ignore shock absorbing / reduced friction				
		Total	7					

Question		Expected Answers	Marks	Additional Guidance								
7	(a)	(i) <u>mitosis</u> (1)	1									
		(ii) (with a) needle / syringe (1)	1	ignore injection								
		(iii) may harm foetus / may cause miscarriage / findings may lead to possibility of termination / need to plan for child with disorder / risk of infection / risk of MRSA (1)	1	ignore references to finding named abnormalities allow baby / embryo								
	(b)	(i) double – because heart has 4 chambers / some blood goes to lungs / some blood travels twice through heart on each circulation (1) or single – because 2 sides of heart are linked / blood from both sides of heart is mixed / some blood only travels once through heart on each circulation (1)	1	explanation must match answer for blood passing through the heart then must refer to a full circuit allow ‘both’ if correct explanation								
		(ii) gets oxygen from placenta / does not get oxygen from lungs (1)	1	allow gets oxygen (from mother) via umbilical cord allow gets oxygen from mother’s blood ignore gets oxygen from mother ignore lungs not yet developed								
	(c)	(i) Heidi – antigen A, antibody B Foetus – antigen B, antibody A (1) <table border="1" data-bbox="367 1027 1072 1181"> <tbody> <tr> <td style="text-align: center;">✓</td> <td></td> <td></td> <td style="text-align: center;">✓</td> </tr> <tr> <td></td> <td style="text-align: center;">✓</td> <td style="text-align: center;">✓</td> <td></td> </tr> </tbody> </table>	✓			✓		✓	✓		1	All 4 ticks needed for 1 mark more than 4 ticks = 0
✓			✓									
	✓	✓										
		(ii) agglutination / antibodies binding to antigens (1)	1	allow damage caused by different blood pressures ignore try to reject each other / attack / destroy ignore blood clots								
Total			7									

Question		Expected Answers	Marks	Additional Guidance								
8	(a)	live plants → wireworm → centipede dead plant material → earthworm (1)	1									
	(b)	they make burrows that let oxygen into the soil (1)	1	more than one tick no mark								
	(c) (i)	the leaves rot or decompose faster / increase mineral content (1)	1	allow mixes up the mineral content allow increase nitrates / nutrients ignore nitrogen								
	(ii)	<table border="1"> <thead> <tr> <th>difference</th> <th>reason</th> </tr> </thead> <tbody> <tr> <td>more lime leaves dragged by tip ora (1) or more rhododendron leaves dragged by stalk ora (1)</td> <td>more streamlined / tapered AW (1)</td> </tr> <tr> <td>more even pattern of numbers of rhododendron leaves dragged between tip and stalk compared to lime (1)</td> <td>equally more streamlined / tapered at both ends unlike lime AW (1)</td> </tr> <tr> <td>no rhododendron leaves dragged in from middle of leaf ora (1)</td> <td>too wide AW (1)</td> </tr> </tbody> </table>	difference	reason	more lime leaves dragged by tip ora (1) or more rhododendron leaves dragged by stalk ora (1)	more streamlined / tapered AW (1)	more even pattern of numbers of rhododendron leaves dragged between tip and stalk compared to lime (1)	equally more streamlined / tapered at both ends unlike lime AW (1)	no rhododendron leaves dragged in from middle of leaf ora (1)	too wide AW (1)	2	<p>Mark the question as a whole and credit any correct response</p> <p>Reasons must match the difference ignore reference to surface area allow correct references to differences in numbers allow correct comparison of leaf width / stiffness allow for reason rhododendron stalk easier to get hold of than lime stalk / lime tip is easier to get hold of</p> <p>allow for reason thin along rhododendron's length / lime leaves similar width all round</p>
difference	reason											
more lime leaves dragged by tip ora (1) or more rhododendron leaves dragged by stalk ora (1)	more streamlined / tapered AW (1)											
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no rhododendron leaves dragged in from middle of leaf ora (1)	too wide AW (1)											
Total			5									

Question			Expected Answers	Marks	Additional Guidance
9	(a)	(i)	<p>crops / the growth of GM crops / area is increasing (in both types of countries / in the world) (1)</p> <p>but the growth / increase in developing countries is faster ora = (2)</p> <p>the proportion of the world GM production is becoming more equally split between developing and developed countries (1)</p> <p>growth in developed countries is (always) higher than in developing countries ora (1)</p>	2	<p>allow the countries are increasing ignore it/ they / both / all are increasing</p> <p>allow the countries are becoming the same</p>
		(ii)	<p>developing countries grew less than 58 (52 -57) (million hectares in 2007) (1)</p>	1	<p>not just developed countries grew 60 million allow the crops / the growth / area in developing countries did not reach that high</p>
	(b)		<p>restriction (1) transgenic (1)</p>	2	
			Total	5	

Question		Expected Answers	Marks	Additional Guidance
10	(a)	Vibrio (1)	1	
	(b)	(using their) flagellum (1)	1	ignore tail
	(c)	any two from: sewage/sanitation systems damaged / leak (1) (drinking) water contaminated (1) health services disrupted (1)	2	(drinking) water contaminated by sewage = 2 allow transport systems disrupted
		Total	4	

Question		Expected Answers	Marks	Additional Guidance
11	(a)	rapid growth / surface of water covered with algae (1)	1	allow reproduce quickly allow increase in growth/population ignore growth unqualified
	(b)	ammonia (1) nitrifying (1)	2	allow nitrates ignore ammonium allow nitrosomonas / nitrobacter
	(c)	any three from: algae die (1) are decomposed by bacteria (1) all the oxygen is used up (by bacteria) (1) animals are unable to respire (1)	3	allow algae blocks light to plants below and plants die allow broken down by bacteria / saprophytes / decomposers / detritivores ignore feeding unless qualified by saprophytes / decomposers / detritivores allow when plants die not enough oxygen produced ignore algae use up oxygen ignore fish/animals suffocate
		Total	6	

OCR (Oxford Cambridge and RSA Examinations)
1 Hills Road
Cambridge
CB1 2EU

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Telephone: 01223 553998

Facsimile: 01223 552627

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