OCR
RECOGNISING ACHIEVEMENT

GCSE

Biology B

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

Unit 2: Modules B4, B5, B6

Mark Scheme for June 2010

Oxford Cambridge and RSA Examinations

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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)		**(advantage)** animals not kept in cramped conditions / no chemicals in meat produced / less maintenance of pens (1) **(disadvantage)** more energy 'lost' (to environment) / less efficient / more diseases amongst pigs (1)	2	**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 **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
	(b)		roots and leaves (1)	1	more than one tick no mark
	(c)	(i)	yellow (1)	1	more than one colour no mark
		(ii)	chlorophyll (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)	spongy mesophyll (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)		**any three from:** homeostasis ideas: regulate water loss / control blood concentration / removes excess water / removes excess salts (1) filter **blood** (1) (at high) pressure (1) re-absorb water / useful substances (1) remove urea / waste products from blood (1) make urine (1)	3	 **ignore** filter fluids **allow** 'ultrafiltration' = 2 **allow** named examples eg sugar / amino acids / salts **ignore** clean blood / remove waste from body **ignore** excretes urine
	(b)	(i)	**two** from: tissue match / same DNA / same blood group / same genes(1) same / similar size / same age (1) he knows his brother's health / lifestyle (1) avoids waiting lists (1)	2	 **allow** not rejected / will not need so many anti rejection drugs but **ignore** similar
		(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) ✓ | | | ✓	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)	mitosis (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) ✓ ✓ ✓ ✓	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	

<table>
<tr><th colspan="3">Question</th><th>Expected Answers</th><th>Marks</th><th>Additional Guidance</th></tr>
<tr><td>8</td><td>(a)</td><td></td><td>live plants → wireworm → centipede
dead plant material → earthworm (1)</td><td>1</td><td></td></tr>
<tr><td></td><td>(b)</td><td></td><td>they make burrows that let oxygen into the soil (1)</td><td>1</td><td>more than one tick no mark</td></tr>
<tr><td></td><td>(c)</td><td>(i)</td><td>the leaves rot or decompose faster / increase mineral content (1)</td><td>1</td><td>allow mixes up the mineral content
allow increase nitrates / nutrients
ignore nitrogen</td></tr>
<tr><td></td><td></td><td>(ii)</td><td><table><tr><th>difference</th><th>reason</th></tr><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></table></td><td>2</td><td>Mark the question as a whole and credit any correct response

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

allow for reason thin along rhododendron’s length / lime leaves similar width all round</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>5</td><td></td></tr>
</table>

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

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