

Biology A

General Certificate of Secondary Education

Unit **A221/01**: Modules B1, B2, B3 (Foundation Tier)

Mark Scheme for June 2011

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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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MARKING INSTRUCTIONS

1. Annotations

Used in the detailed Mark Scheme:

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
(1)	separates marking points
not/reject	answers which are not worthy of credit
ignore	statements which are irrelevant - applies to neutral answers
allow/accept	answers that can be accepted
(words)	words which are not essential to gain credit
<u>words</u>	underlined words must be present in answer to score a mark
ecf	error carried forward
AW/owtte	credit alternative wording / or words to that effect
ORA	or reverse argument

2. Subject-specific Marking Instructions

- a. Accept any clear, unambiguous response (including mis-spellings of scientific terms if they are *phonetically* correct, but always check the guidance column for exclusions).
- b. If a candidate alters his/her response, examiners should accept the alteration.
- c. Crossed out answers should be considered only if no other response has been made. When marking crossed out responses, accept correct answers which are clear and unambiguous.

e.g. for a one-mark question where ticks in the third and fourth boxes are required for the mark:

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth 1 mark.

<input type="checkbox"/>
<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth 0 marks.

<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>
<input type="checkbox"/>

This would be worth 1 mark.

d. The list principle:
 If a list of responses greater than the number requested is given, work through the list from the beginning. Award one mark for each correct response, ignore any neutral response, and deduct one mark for any incorrect response, e.g. one which has an error of science. If the number of incorrect responses is equal to or greater than the number of correct responses, no marks are awarded. A neutral response is correct but irrelevant to the question.

e. Marking method for tick-box questions:
 If there is a set of boxes, some of which should be ticked and others left empty, then judge the entire set of boxes. If there is at least one tick, ignore crosses and other markings. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses. Credit should be given according to the instructions given in the guidance column for the question. If more boxes are ticked than there are correct answers, then deduct one mark for each additional tick. Candidates cannot score less than zero marks.

e.g. if a question requires candidates to identify cities in England:

Edinburgh	<input type="checkbox"/>
Manchester	<input type="checkbox"/>
Paris	<input type="checkbox"/>
Southampton	<input type="checkbox"/>

the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third should be blank (or have indication of choice crossed out).

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	x	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	x		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR

Question		Answer	Mark	Guidance
1	a	no copies (1) two copies (1) two alleles (1)	3	accept a clear, alternative response eg. cross, shaded box
	b	alleles/genes/chromosomes/DNA (1) from (both) parents, A/W (1)	2	accept live in the same environment (as their parents) reject inherit 23 pairs of chromosomes from each parent
Total			[5]	

2	a	any two from: problems with / lack of concentration; ... memory; ... co-ordination;	1	two correct responses required for one mark. ignore second example of the same symptom ignore generalisations eg. 'walking into things', nervous system accept any correct responses eg. dementia/confusion, speech, correct explanations of poor muscle control = co-ordination
	b	any two from: height - several genes; Huntington's - single/one gene; Huntington's is dominant; height affected by environment / OWTTE;	2	several and single genes must be explicit Huntington's is caused by 1 dominant allele = 2 marks
	c	i	1	whether or not to have children (1) answer must be about a decision and not about a question
		ii	1	whether or not to have a termination/abortion/keep the baby (1) answer must be a decision and not a question
	d	i	1	genetic testing (1) ignore other additional information
		ii	1	Jane (1) accept a clear, alternative response
Total			[7]	

Question		Answer	Mark	Guidance
3	a	<div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="width: 40%;"> <p style="margin-left: 40px;"><input type="checkbox"/></p> <p style="margin-left: 40px;"><input type="checkbox"/></p> <p style="margin-left: 40px;">sweat <input checked="" type="checkbox"/></p> <p style="margin-left: 40px;">skin <input checked="" type="checkbox"/></p> <p style="margin-left: 40px;"><input type="checkbox"/></p> <p style="margin-left: 40px;"><input type="checkbox"/></p> <p style="margin-left: 40px;">tears <input checked="" type="checkbox"/></p> <p style="margin-left: 40px;">stomach acid <input checked="" type="checkbox"/></p> </div> <div style="width: 50%; text-align: center;"> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input checked="" type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> </div> </div>	2	4 correct = 2 marks 3 or 2 correct = 1 mark 1 or 0 correct = 0 marks accept a clear, alternative response eg. cross, shaded box
	b	toxins; white blood cells; engulf; antibodies;	3	4 correct = 3 marks 3 correct = 2 marks 2 correct = 1 mark 1 or 0 correct = 0 marks accept a clear, alternative response eg. cross, shaded box
	c	<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="width: 40%;"> <p style="margin-left: 40px;">2 hours and 40 minutes</p> </div> <div style="width: 50%; text-align: center;"> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> <p><input checked="" type="checkbox"/> (1)</p> <p><input type="checkbox"/></p> <p><input type="checkbox"/></p> </div> </div>	1	accept a clear, alternative response eg. cross, shaded box ignore calculations shown accept the correct answer (2 hours and 40 minutes) if written as part of calculation – but only if a box has not been ticked
Total			[6]	

Question		Answer	Mark	Guidance												
4	a	heart needs oxygen/glucose; idea of thick walls so not getting (sufficient oxygen / glucose); by diffusion;	3	accept sugar = glucose												
	b	<pre> graph LR vein[vein] --- large_lumen[large lumen] vein --- valves[valves] large_lumen --- allow_blood[allow blood ...] large_lumen --- stop[stop ...] valves --- stop valves --- empty_box1[] </pre>	2	one mark for each correct pair of links across the model ie marked across the model												
	c	<table border="1"> <tbody> <tr> <td>Eating a high fat diet ...</td> <td>Mary</td> <td>(1)</td> </tr> <tr> <td>The more cigarettes ...</td> <td>Robin</td> <td>(1)</td> </tr> <tr> <td>My grandad drank four pints ...</td> <td>John</td> <td>(1)</td> </tr> <tr> <td>A new report says that ...</td> <td>Angela</td> <td>(1)</td> </tr> </tbody> </table>	Eating a high fat diet ...	Mary	(1)	The more cigarettes ...	Robin	(1)	My grandad drank four pints ...	John	(1)	A new report says that ...	Angela	(1)	4	accept a clear, alternative indication of the correct answer
Eating a high fat diet ...	Mary	(1)														
The more cigarettes ...	Robin	(1)														
My grandad drank four pints ...	John	(1)														
A new report says that ...	Angela	(1)														
Total			[9]													

Question		Answer	Mark	Guidance															
5	a	<table border="1"> <thead> <tr> <th></th> <th>environ- ment</th> <th>genes</th> <th>both</th> <th>neither</th> </tr> </thead> <tbody> <tr> <td>caused</td> <td></td> <td></td> <td>✓</td> <td></td> </tr> <tr> <td>passed</td> <td></td> <td>✓</td> <td></td> <td></td> </tr> </tbody> </table>		environ- ment	genes	both	neither	caused			✓		passed		✓			2	
	environ- ment	genes	both	neither															
caused			✓																
passed		✓																	
	b	<p>any three from: organisms show variation; different organisms compete with each other; some organisms (therefore) have a greater chance of survival / survival of the fittest; those surviving will reproduce; and pass on the characteristics to the next generation;</p>	3	responses must be in the correct context accept reverse argument															
	c	<table border="1"> <thead> <tr> <th></th> <th>natural selection</th> <th>selective breeding</th> </tr> </thead> <tbody> <tr> <td>bacterial ...</td> <td>✓</td> <td></td> </tr> <tr> <td>rose bushes ...</td> <td></td> <td>✓</td> </tr> <tr> <td>pedigree dogs</td> <td></td> <td>✓</td> </tr> </tbody> </table>		natural selection	selective breeding	bacterial ...	✓		rose bushes ...		✓	pedigree dogs		✓	2	3 correct = 2 marks 2 correct = 1 mark 1 or 0 correct = 0 marks			
	natural selection	selective breeding																	
bacterial ...	✓																		
rose bushes ...		✓																	
pedigree dogs		✓																	
Total			[7]																

Question		Answer	Mark	Guidance					
6	a	<p>any two from: blood sugar level; growth/development; water level; stress response; secondary sexual characteristics;</p>	2	<p>OWTTE</p> <p>accept any two suitable answers for hormonal action in different situations ignore mood eg. crying, upset, angry</p>					
	b	<div style="text-align: center;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> .. a better chance of survival <input checked="" type="checkbox"/> (1) <input type="checkbox"/> </div>	1	<p>accept a clear, alternative indication of a correct response eg. cross, shaded box</p>					
	c	<div style="text-align: center;"> <table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">C</td> <td style="padding: 5px;">B</td> <td style="padding: 5px;">A</td> <td style="padding: 5px;">E</td> <td style="padding: 5px;">D</td> </tr> </table> <p>A in centre box (1) C before B on left side of centre (1) E before D on right side of centre (1)</p> </div>	C	B	A	E	D	3	
C	B	A	E	D					
Total			[6]						

Question	Answer	Mark	Guidance
7	<input type="checkbox"/> ... observation that agreed ... <input checked="" type="checkbox"/> (1) ... increased the confidence ... <input checked="" type="checkbox"/> (1) <input type="checkbox"/> <input type="checkbox"/>	2	
	Total	[2]	

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