

Biology A

General Certificate of Secondary Education **A221/02**

Unit 1: Modules B1, B2, B3

Mark Scheme for June 2010

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by Examiners. It does not indicate the details of the discussions which took place at an Examiners' meeting before marking commenced.

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.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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Guidance for Examiners

Additional Guidance within any mark scheme takes precedence over the following guidance.

1. Mark strictly to the mark scheme.
2. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.
3. Accept any clear, unambiguous response which is correct, e.g. mis-spellings if phonetically correct (but check additional guidance).
4. Abbreviations, annotations and conventions used in the detailed mark scheme:

/	= 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	= alternative wording
ORA	= or reverse argument

E.g. mark scheme shows 'work done in lifting / (change in) gravitational potential energy' (1)
 work done = 0 marks
 work done lifting = 1 mark
 change in potential energy = 0 marks
 gravitational potential energy = 1 mark

5. Annotations:

The following annotations are available on SCORIS.

✓	= correct response
✗	= incorrect response
bod	= benefit of the doubt
nbod	= benefit of the doubt not given
ECF	= error carried forward
^	= information omitted
I	= ignore
R	= reject

6. If a candidate alters his/her response, examiners should accept the alteration.
7. 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 boxes 3 and 4 are required for the mark:

Put ticks (✓) in the two correct boxes.

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

This would be worth 0 marks.

Put ticks (✓) in the two correct boxes.

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

This would be worth one mark.

Put ticks (✓) in the two correct boxes.

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

This would be worth one mark.

8. 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.

9. Marking method for tick boxes:

Always check the additional guidance.

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. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses.

Credit should be given for each box correctly ticked. 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 a city in England, then in the boxes

Edinburgh	
Manchester	
Paris	
Southampton	

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).

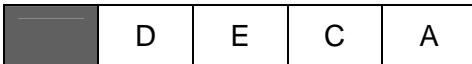
Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	✗	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	✗		✓		✓	✓		✓	
Score:	2	2	1	1	1	1	0	0	0	NR

Question			Expected Answers	Marks	Additional Guidance
1	a		Y (1)	[1]	accept Y or Y with chromosome above
	b		gene causes development of testes (1)	[1]	accept gene codes for/causes production of testosterone/androgens/TDF ignore SRY ignore reference to male sex organs
	c		height (1)	[1]	
Total				[3]	

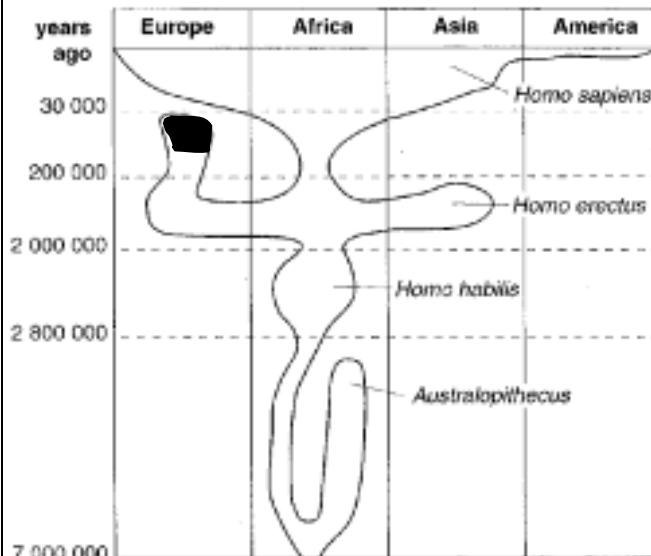
2	a		mum and dad (1)	[1]	accept parents reject one of her parents / mum OR dad
	b	i	recessive (1)	[1]	
		ii	A (1)	[1]	
		iii	B, C and E (1)	[1]	three correct = 1 mark accept any order
		iv	we do not know if E has passed on the CF allele (1) we do not know if E's wife has the CF allele / is a carrier (1) if E's wife has got the CF allele we do not know if she's passed it on (1)	[3]	NB "Her mum" = "E's wife"
			Total	[7]	

Question		Expected Answers	Marks	Additional Guidance
3	a	any two from: he may not want to know; privacy; may affect his employment prospects; could affect insurance (costs); false neg / false pos / reliability arguments;	[2]	ignore moral or religious answers
	b	any staffing implication answer (1) any financial implication answer (1)	[2]	eg sacking / redeployment / H&S / suitability of roles ignore to see who is healthy, without implication eg sickness pay / cost company / loss of production
Total			[4]	

Question		Expected Answers	Marks	Additional Guidance
4	a	nucleus from a body cell (1)	[1]	
	b	<p>... asexual reproduction ... <input checked="" type="checkbox"/> (✓)</p> <p>... photocopies ... <input type="checkbox"/></p> <p>... bacteria ... <input checked="" type="checkbox"/> (✓)</p> <p>... artist's drawing ... <input type="checkbox"/></p> <p>identical twins <input checked="" type="checkbox"/> (✓)</p> <p>... sperm ... <input type="checkbox"/></p>	[2]	<p>three correct responses = 2 marks two correct responses = 1 mark if more than three boxes ticked then minus 1 mark for each incorrect answer</p> <p>allow any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc</p>
	c	environmental factors only (1)	[1]	accept any other indication of correct response
	d	<p>... unspecialised can develop ... <input checked="" type="checkbox"/> (1)</p> <p>... unspecialised... ... cannot develop ... <input type="checkbox"/></p> <p>... treat diseases. <input checked="" type="checkbox"/> (1)</p> <p>... grow different species ... <input type="checkbox"/></p> <p>... specialised can develop ... <input type="checkbox"/></p> <p>... specialised cannot develop ... <input type="checkbox"/></p>	[2]	<p>if more than two boxes ticked then minus 1 mark for each incorrect answer</p> <p>allow any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc</p>
		Total	[6]	

Question		Expected Answers	Marks	Additional Guidance
5	a	 D before E (1) E before C (1) C before A (1)	[3]	
	b	... hormonal high mutation ... <input type="checkbox"/> ... hormonal low mutation ... <input type="checkbox"/> ... immune high mutation ... <input checked="" type="checkbox"/> (1) ... immune low mutation ... <input type="checkbox"/> ... nervous high mutation ... <input type="checkbox"/> ... nervous low mutation ... <input type="checkbox"/> ... reproductive high mutation ... <input type="checkbox"/> ... reproductive low mutation ... <input type="checkbox"/>	[1]	if more than one box ticked then 0 marks allow any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc
		Total		[4]
6	a	Peter (1)	[1]	
	b	Ranjit (1)	[1]	
	c	Stella (1)	[1]	
	d	Jane and Ranjit (1)	[1]	either way round
		Total		[4]

Question		Expected Answers	Marks	Additional Guidance
7	a	Ben; Louise;	[1]	two correct responses = 1 mark responses must be in the correct order if no response then open up full screen to check for answers elsewhere
	b	what – inactive / fake / not real drug / look alike / blank (1) why - to test/compare results / idea of control (1) when - if health / life of patient would be at risk without effective treatment / if effective treatment is needed(1)	[3]	accept used instead of actual drug accept to eliminate / control named factors ignore used in drugs trials – as that is in stem ignore to see if illness has a psychological cause ignore should not be used on sick people ignore ill patients should be given the NEW drug being trialled / should not be given the placebo
		Total	[4]	

Question			Expected Answers		Marks	Additional Guidance
8	a			[1]	<p>shading may be extended into the 'L' shape then give mark</p> <p>shaded area must not extend significantly beyond the L shape</p> <p>shading must not go into central area</p>	
	b	i	<p>All common ancestor. <input checked="" type="checkbox"/> (1)</p> <p>Only one common ancestor. <input type="checkbox"/></p> <p><i>Australopithecus</i> ... <input type="checkbox"/></p> <p>None common ancestor. <input type="checkbox"/></p> <p><i>Homo erectus</i> ... <input type="checkbox"/></p>	[1]	<p>allow any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc</p>	

Question			Expected Answers	Marks	Additional Guidance
8	b	ii	<p>... central evolution. <input type="checkbox"/></p> <p>... convergent evolution. <input type="checkbox"/></p> <p>... divergent evolution. <input checked="" type="checkbox"/> (1)</p> <p>... negative evolution. <input type="checkbox"/></p>	[1]	allow any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc
		iii	<i>Homo sapiens</i> (1)	[1]	accept humans
	c		any two from: idea that brain got bigger / larger / complex / developed; (better chance of) survival / breeding / pass on genes; idea of intelligence eg brighter / smarter; example of intelligence eg using tools / speech / talking / writing / fire;	[2]	ignore live longer ignore learning / knowledge / thinking / self aware / memory ignore communication / building / hunting / farming / use of hands/ bipedal
	d		any two from: idea that not enough evidence / data / results; idea of conflicting data/evidence/results / two different explanations, theories or interpretations; loss of sponsorship etc;	[2]	do not credit specific reference to Darwin or theories of evolution ignore no evidence ignore reference to God ignore arguments about loss of face; ignore reference to "thinking you are right" ignore reference to different experiments / different ideas.
			Total	[8]	

Question		Expected Answers	Marks	Additional Guidance
9		<p>It proves ... <input type="checkbox"/></p> <p>It increases ... <input checked="" type="checkbox"/> (1)</p> <p>It makes no difference ... <input type="checkbox"/></p> <p>It decreases ... <input type="checkbox"/></p> <p>It agrees with ... <input checked="" type="checkbox"/> (1)</p> <p>It disagrees with ... <input type="checkbox"/></p>	[2]	<p>if more than two boxes ticked then minus 1 mark for each incorrect answer</p> <p>allow any other indication of correct response if no ticks, eg underlining, cross, shaded, smiley face etc</p>
		Total	[2]	

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