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OCR
Oxford Cambridge and RSA

GCSE

Biology A

Unit **A161/01**: Modules B1, B2, B3 (Foundation Tier)

General Certificate of Secondary Education

Mark Scheme for June 2015

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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.

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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
words	underlined words must be present in answer to score a mark
ecf	error carried forward
AW/owtte	alternative wording
ORA	or reverse argument

Available in scoris to annotate scripts

	indicate uncertainty or ambiguity
	benefit of doubt
	contradiction
	incorrect response
	error carried forward
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	no benefit of doubt

R	reject
✓	correct response
≈	draw attention to particular part of candidate's response
^	information omitted

Subject-specific Marking Instructions

a. If a candidate alters his/her response, examiners should accept the alteration.

b. 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.

This would be worth 1 mark.

Put ticks (✓) in the two correct boxes.

This would be worth 0 marks.

Put ticks (✓) in the two correct boxes.

This would be worth 1 mark.

c. 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.

d. 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.

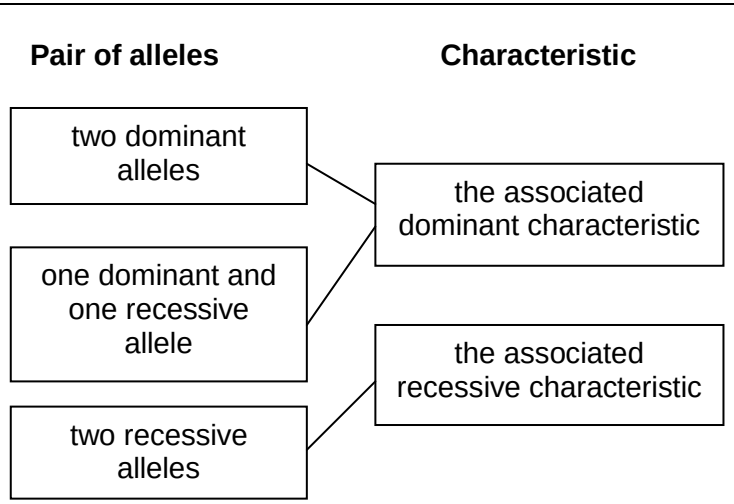
E.g. If a question requires candidates to identify a city in England, then in the boxes

Edinburgh	
Manchester	
Paris	
Southampton	

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

Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	×	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	×		✓		✓	✓		✓	
Score:	**2**	**2**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**NR**

MARK SCHEME (A161/01):

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Mark</th><th>Guidance</th></tr>
<tr><td>1</td><td>a</td><td></td><td> 
</td><td>2</td><td>one mark for two recessive correctly linked to characteristic

one mark for both two dominant and one dominant correctly linked to characteristic

credit if line is crossed out and no obvious replacement drawn</td></tr>
<tr><td></td><td>b</td><td></td><td><table>
<tr><th>symptom</th><th>cystic fibrosis</th><th>Huntington’s disease</th></tr>
<tr><td>chest infections</td><td>✓</td><td></td></tr>
<tr><td>memory loss</td><td></td><td>✓</td></tr>
<tr><td>thick mucus</td><td>✓</td><td></td></tr>
<tr><td>tremor</td><td></td><td>✓</td></tr>
</table></td><td>2</td><td>one mark for each vertical column correct</td></tr>
</table>

Question			Answer	Mark	Guidance
1	c	i	*each mark is for error and correction:* FF offspring should be ff (1) (one) ff offspring should be Ff (1)	2	accept corrections on the grid accept a diagram of the corrected grid for two marks accept identification of both errors (without corrections) = 1
		ii	0.5	1	allow 1/2, 2 in 4, 1:1, 50%, 50:50 accept any correct fraction e.g 50/100
			Total	**7**	

Question			Answer	Mark	Guidance
2			**[Level 3]** Gives a good explanation as to why the baby is different to Poppy AND to its parents. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Gives a good explanation as to why the baby is different to Poppy OR to its parents. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Makes any correct statement about the processes involved not linked to Poppy or parents. Quality of written communication impedes communication of the science at this level. (1 – 2 marks) **[Level 0]** Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)	6	**This question is targeted at grades up to C** **Indicative scientific points may include:** General reasons for differences (applicable to parents and Poppy) • variation • inherit different (combinations) of chromosomes • inherit different (combinations) of genes/alleles • alleles can be dominant/recessive • environmental factors Reasons why baby is different to Poppy: • sexual reproduction • different egg & sperm • genetic abnormalities/mutation • ref to the fact it could be a boy • different combination of sex chromosomes Reasons why new baby is different to parents: • each parent only contributes half the genes/alleles • will show some similarities but won't be identical
			Total	**6**	

Question			Answer	Mark	Guidance
3	a		F	1	
	b		B	1	
	c		C	1	
	d		A	1	
			Total	**4**	
4	a	i	*Fred is correct* *any two from:* A/artery has thicker muscle or B/Vein has thinner muscle (1) A/artery has a thicker wall or B/Vein has thinner wall (1) A/Artery has smaller lumen or /B/vein has larger lumen (1)	2	if candidate indicates Fred is incorrect = 0 credit comparative responses e.g artery wall is thick, vein wall is thin ignore hole/space
		ii	valves	1	
	b	i	B in first box (1) D A C (1)	2	look for DAC in correct order ignore position of B e.g DBAC =1

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Mark</th><th>Guidance</th></tr>
<tr><td></td><td>b</td><td>ii</td><td>[Level 3]
Describes two or more factors that increase the risk of heart disease.
Quality of written communication does not impede communication of the science at this level.
(5 – 6 marks)

[Level 2]
Lists several factors that increase the risk of heart disease.
Quality of written communication partly impedes communication of the science at this level.
(3 – 4 marks)

[Level 1]
Lists some factors that may increase risk of heart disease. Quality of written communication impedes communication of the science at this level.
(1 – 2 marks)

[Level 0]
Insufficient or irrelevant science. Answer not worthy of credit.
(0 marks)</td><td>6</td><td>This question is targeted at grades up to E

Indicative scientific points may include:

<table><tr><th>Factor</th><th>Description</th></tr><tr><td>salt in diet</td><td>diet high in salt</td></tr><tr><td>fat /cholesterol in diet</td><td>diet high in fat/cholesterol</td></tr><tr><td>stress</td><td>more stress/examples of stress</td></tr><tr><td>smoking</td><td>smoking many cigarettes</td></tr><tr><td>drugs</td><td>regular/overuse/misuse of drugs</td></tr><tr><td>exercise</td><td>less/no exercise</td></tr><tr><td>blood pressure</td><td>high blood pressure</td></tr><tr><td>drinking alcohol</td><td>drinking a lot of alcohol</td></tr><tr><td>genetics/runs in the family</td><td></td></tr></table>
ignore vague ref to poor diet, junk food and unhealthy lifestyle
do not accept drinking unqualified</td></tr>
</table>

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Mark</th><th>Guidance</th></tr>
<tr><td></td><td>c</td><td>i</td><td>
<table>
<tr><td>Each drug works in the same way in every person.</td><td></td></tr>
<tr><td>Less money is wasted prescribing drugs that don’t work.</td><td>✓</td></tr>
<tr><td>Doctors don’t have to learn about so many drugs.</td><td></td></tr>
<tr><td>People won’t have to visit the doctor anymore.</td><td></td></tr>
<tr><td>The drugs will always cure the patient from the disease.</td><td></td></tr>
<tr><td>It may reduce the number of people who suffer dangerous side effects.</td><td>✓</td></tr>
<tr><td>The doctor can adjust the dose of the drug to suit the patient.</td><td>✓</td></tr>
</table>
</td><td>3</td><td>All three correct for three marks
Two correct for two marks
One correct for one mark

More than 3 boxes ticked, negate 1 mark for each additional tick.</td></tr>
<tr><td></td><td></td><td>ii</td><td>
<table>
<tr><td>Some people might be discriminated against the test result is known.</td><td>✓</td></tr>
<tr><td>Some people might find the test painful.</td><td></td></tr>
<tr><td>It will cost too much to test everyone.</td><td></td></tr>
<tr><td>The results of the test might be inaccurate.</td><td></td></tr>
<tr><td>We all have the right to choose whether they are tested or not.</td><td>✓</td></tr>
</table>
</td><td>2</td><td>More than 2 boxes ticked, negate 1 mark for each additional tick.</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>16</td><td></td></tr>
</table>

Question			Answer	Mark	Guidance
5	a		*qualitative answers:* stays low/stable/the same (from Oct to Feb) idea of increase (from Feb to Apr) (1) peaks/highest in April (1) idea of decrease (from Apr to June) (1) then: any correct ref to figures (1)	3	max 2 for qualitative answers starts low is not enough look for idea of low numbers over several months figures are for any correct value **linked** to a stated month (or any calculated increase/decrease)
5	b	i	Jo	1	
		ii	Stacy	1	
		iii	*any 2 from:* Rhys, Hilary and Stacy	1	
		iv	risk: painful / side effects / may get a temperature / allergic / rash /ache / shows symptoms / death / could catch mumps/measles/rubella benefit: stops baby getting mumps/measles/rubella / baby is immune/description of immunity	2	need one risk and one benefit for 2 marks **ignore** baby can react differently / vague references to ill/sick **ignore** stops baby getting MMR / stops baby getting it/a/the disease(s) unqualified accept ref to herd immunity
			Total	**8**	

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Mark</th><th>Guidance</th></tr>
<tr><td>6</td><td>a</td><td>i</td><td>circle around ‘2’(1)</td><td>1</td><td>accept any clear indication that 2 is the outlier</td></tr>
<tr><td></td><td></td><td>ii</td><td>10 (2)</td><td>2</td><td>10.25 = 1 mark max

If answer incorrect allow correct working for one mark 41/4 (1)

If no answer given check table for correct answer</td></tr>
<tr><td></td><td>b</td><td></td><td><table>
<tr><td>The water at site B is most polluted.</td><td>✓</td></tr>
<tr><td>Mayfly nymphs are adapted to living in polluted water.</td><td></td></tr>
<tr><td>Mayfly nymphs cannot survive well in polluted water.</td><td>✓</td></tr>
<tr><td>Pollution in the river increases away from the farm.</td><td></td></tr>
<tr><td>Mayfly nymphs are present in the sewage entering the river.</td><td></td></tr>
<tr><td>Mayfly nymphs are eaten by fish in the river.</td><td></td></tr>
</table></td><td>2</td><td>More than 2 boxes ticked, negate 1 mark for each additional tick.</td></tr>
</table>

Question			Answer	Mark	Guidance
6	c		**Level 3]** Candidates include a detailed explanation of all 3 stages Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Candidates include a detailed explanation of two stages Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Candidates include a detailed explanation of one stage Quality of written communication impedes communication of the science at this level. (1 – 2 marks) **[Level 0]** Insufficient or irrelevant science. Answer not worthy of credit. (0 marks)	6	**This question is targeted at grades up to C** **Indicative scientific points may include:** stage A: • uptake of/absorption of/taking in/takes up/taking (nitrates into plants) **ignore** "passes into" / "goes in" • via roots/root hairs • active transport • (nitrates) used to make protein stage B: • plants eaten by animals • digestion/assimilation • transfer of nitrogen (compounds)/protein along food chain (ignore transfer of **nitrate** from plant to animal) stage C: • excretion/egestion/urine/faeces/waste • death • decay/decomposition/ decomposers/fungi/bacteria • break down waste into nitrates • returns to the soil **ignore** denitrification/nitrogen fixation
			Total	**11**	

Question			Answer	Mark	Guidance
7	a		Mutation (1)	1	
	b	i	label: (number /amount/butterflies) genetic changes / mutations any line that starts higher on the left and ends lower on the right	2	 do not allow horizontal or vertical lines
	b	ii	*any two from:* suggestion of another cause / there might be another factor causing the changes (1) need more evidence/need more data (1) only shows a correlation (not enough to prove a cause) (1)	2	 examples of other causes include environmental change / pollution / other gases / age / it happened naturally ignore evolution/natural selection / different species of butterfly as another cause **do not allow no** evidence
	c		*any three from:* variation/AW (1) gives a (selective) advantage/idea of **better** adapted (1) individuals more likely to survive (1) **more likely** to reproduce (1) passes the gene/characteristic/genetic change/mutation (on to its offspring) (1) **OR** gives a (selective) disadvantage/less well adapted (1) individuals less likely to survive (1) won't reproduce(1) cannot pass the gene/characteristic/genetic change/mutation on to its offspring (1)	3	 variation must be within the original population accept a specific example of selective advantage e.g bigger wings if no credit is given for advantage and survival points award 1 mark for survival of the fittest accept a specific example of selective disadvantage e.g no wings
			Total	**8**	

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