OCR
RECOGNISING ACHIEVEMENT

GCSE

Biology A

General Certificate of Secondary Education

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

Mark Scheme for January 2013

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, Cambridge Nationals, Cambridge Technicals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

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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.

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. 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 <u>and</u> fourth boxes are required for the mark:

This would be worth 1 mark.

This would be worth 0 marks.

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-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	
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**

e. For answers marked by levels of response:

i. **Read through the whole answer from start to finish**
ii. **Decide the level** that **best fits** the answer – match the quality of the answer to the closest level descriptor
iii. **To determine the mark within the level**, consider the following:

Descriptor	Award mark
A good match to the level descriptor	The higher mark in the level
Just matches the level descriptor	The lower mark in the level

iv. Use the **L1**, **L2**, **L3** annotations in Scoris to show your decision; do not use ticks.

Quality of Written Communication skills assessed in 6-mark extended writing questions include:

- appropriate use of correct scientific terms
- spelling, punctuation and grammar
- developing a structured, persuasive argument
- selecting and using evidence to support an argument
- considering different sides of a debate in a balanced way
- logical sequencing.

Question			Answer	Marks	Guidance
1	(a)		X XX XX Y XY XY	2	X} XX XX} } = 1 mark } = 1 mark Y} XY XY}
	(b)		boy is XY girl is XX; equal numbers of XX and XY;	2	Accept 50% chance/50:50 chance/equal chance of having boy or girl for second marking point.

Question			Answer	Marks	Guidance
1	(c)		**Level 3 (5–6 marks)** Refers to genetic and environmental factors, clearly links the factors to explanation of similarities and differences. Correct technical terms. Quality of written communication does not impede communication of the science at this level. **Level 2 (3–4 marks)** Refers to both genetic and environmental factors, probably using some technical terms. Less technical terms, ie more description. Incomplete with only some explanation. Quality of written communication partly impedes communication of the science at this level. **Level 1 (1–2 marks)** Brief vague account, possibly only accounting for either similarities or differences, or give only genetic or only environmental responses. Quality of written communication impedes communication of the science at this level. **Level 0 (0 marks)** Insufficient or irrelevant science. Answer not worthy of credit.	6	**This question is targeted at grades up to E.** **Relevant points include:** **general** environmental factors mentioned genetic factors mentioned **specific** examples of environmental variation given eg food eaten examples of genetic variation given eg skin, hair and eye colour some variation is a combination of both with examples such as weight multiple genes can work together to produce different characteristics characteristics are determined by a combination of maternal and paternal genes genes can be inherited in different combinations **ignore** primary sexual characteristics **Use the L1,L2,L3 annotations in SCORIS; do not use ticks.**
			Total	**10**	

Question			Answer	Marks	Guidance
2	(a)		(both Ali and Mary) they are carriers/they are recessive/ they have a faulty gene;	1	**accept** heterozygous
	(b)	(i)	C;	1	
		(ii)	B;	1	
	(c)	(i)	38 or 39;	1	accept 38 – 39 / 38 to 39
		(ii)	*any two from:* the older the mother; the more likely to have a child with Down's; Or the rate of risk increases with age;; little or no risk at 20–25 years of age; there is a higher risk after 35;	2	**accept** a positive correlation between age and risk
		(iii)	ask patients how they feel ☐ use a larger sample size ✓ collect data for other genetic conditions ☐ collect data for other ages ✓ use smaller graph paper ☐ collect data from just one hospital ☐	2	Deduct 1 mark for each additional incorrect response if more than 2 boxes are ticked. Minimum mark = 0
		(iv)	there is only a small chance of having Down's syndrome; but consequence is large/ any qualification of consequence;	2	accept "there is a 1% chance" for the first marking point consequences include cost, stress, challenging to parent, affects other family members, is a long term commitment.

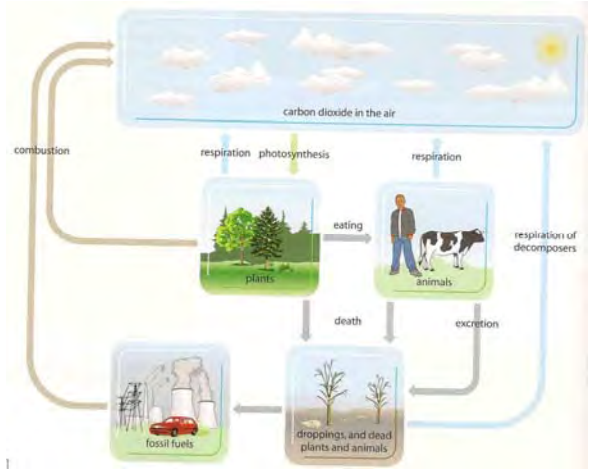
Question	Answer	Marks	Guidance
(d)	**Level 3 (5–6 marks)** Includes several indicative scientific points from at least two or three areas. Quality of written communication does not impede communication of science at this level **Level 2 (3–4 marks)** Includes an indicative scientific point or points from at least two areas. Quality of written communication partly impedes communication of the science at this level. **Level 1 (1–2 marks)** Includes an indicative scientific point or points from at least one area. Quality of written communication impedes communication of the science at this level. **Level 0 (0 marks)** Insufficient or irrelevant science. Answer not worthy of credit.	6	**This question is targeted at grades up to C.** **Indicative scientific points about implications of test may include:** • risk of miscarriage as a result of having the test • results may not be accurate • false positives and false negatives • risk of infection or harm to the foetus **Indicative scientific points about decisions may include:** • whether or not to have children • whether or not they would terminate a pregnancy • who to inform of their decision **Indicative scientific points about implications of not or after testing may include:** • financial implications of having a disabled child • stress on family if they have a disabled child • care issues / quality of life • test result could reveal other information eg paternity issues and other disorders • problems re employment • problems re insurance **Use the L1, L2, L3 annotations in SCORIS; do not use ticks.**
	Total	**16**	

Question			Answer	Marks	Guidance
3	(a)	(i)	B; C; A;	2	3 correct = 2 marks 2 or 1 correct = 1 mark
	(b)	(i)	homeostasis;	1	
		(ii)	nervous; hormonal/endocrine;	2	**accept** either way round
		(iii)	*any two from:* it will have to filter more blood; it will produce urine twice as quickly/take longer; it will produce urine at the same rate as two kidneys; it will need to produce more urine; it will grow bigger;	2	
	(c)	(i)	As age increases… → …the risk decreases at a faster rate. At a certain age… → … the risk stays the same. The younger you are… → … the risk increases.	1	Do not give the mark if more than 1 line is drawn.
		(ii)	it is only an isolated/single case;	1	
			Total	**9**	

Question			Answer	Marks	Guidance
4	(a)		idea that a correlation does not demonstrate a cause / no mechanism given; other factors involved;	2	e.g. no explanation given accept examples of other factors
	(b)		*any two from:* poor diet; being over weight/ obese; stress/high blood pressure; cigarette smoking; misuse of drugs; lack of exercise; age; genetic factors; high cholesterol;	2	accept references to examples e.g.high fat ignore references to vitamins/ minerals
			Total	**4**	

Question			Answer	Marks	Guidance
5	(a)		bacteria/fungi;	1	**reject** virus
	(b)		evidence of doubling in the working; 64;	2	correct response = 2 marks
	(c)		idea that numbers of bacteria in the body will be much less/less damaged caused;	1	**accept** reverse argument that if treatment not commenced the numbers of bacteria will become greater
	(d)		some bacteria may not be killed; bacterial resistance to the antibiotic is more likely;	2	
	(e)		idea that bacteria became resistant to the original antibiotic; bacteria that survive one of other antibiotics; will be killed off by the second antibiotic; idea of preventing development of new resistant strain;	3	**accept** references to “superbug” for idea of resistance
			Total	**9**	

Question			Answer	Marks	Guidance
6	(a)	(i)	The tree will be in a better condition. ✓	1	
		(ii)	…a competitor. ✓ …a predator. ✓	2	
	(b)		*any three from:* heat; waste; uneaten parts; movement; migration;	3	**ignore** references to sunlight accept references to “dead animals” or “animals die”
			Total	**6**	

Question			Answer	Marks	Guidance
7			**Level 3 (5–6 marks)** Includes photosynthesis and two different pathways or processes for CO_2 to enter the atmosphere. Correct technical terms. Quality of written communication does not impede communication of the science at this level. **Level 2 (3–4 marks)** Includes ideas of processes that add and remove CO_2 from the atmosphere, possibly with labelled arrows on the diagram Less technical terms, ie more description. Incomplete with only some explanation. Quality of written communication partly impedes communication of the science at this level. **Level 1 (1–2 marks)** Describes either photosynthesis or a pathway for CO_2 to enter the atmosphere. Quality of written communication impedes communication of the science at this level. **Level 0 (0 marks)** Insufficient or irrelevant science. Answer not worthy of credit.	6	**This question is targeted at grades up to D** **General** diagram and/or explanation **Specific** diagram …  diagram shows correct links explanation of processes of ..... combustion feeding respiration photosynthesis decomposition role of microorganisms **Use the L1, L2, L3 annotations in SCORIS; do not use ticks.**
			Total	**6**	

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

OCR Customer Contact Centre

Education and Learning
Telephone: 01223 553998
Facsimile: 01223 552627
Email: general.qualifications@ocr.org.uk

www.ocr.org.uk

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OCR (Oxford Cambridge and RSA Examinations)
Head office
Telephone: 01223 552552
Facsimile: 01223 552553