OCR
RECOGNISING ACHIEVEMENT

GCSE

Science A

General Certificate of Secondary Education

Unit **A213/01:** Unit 3: Modules B3, C3, P3 (Foundation Tier)

Mark Scheme for June 2012

Oxford Cambridge and RSA Examinations

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, OCR Nationals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

It is also responsible for developing new specifications to meet national requirements and the needs of students and teachers. OCR is a not-for-profit organisation; any surplus made is invested back into the establishment to help towards the development of qualifications and support, which keep pace with the changing needs of today's society.

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.

Any enquiries about publications should be addressed to:

OCR Publications
PO Box 5050
Annesley
NOTTINGHAM
NG15 0DL

Telephone: 0870 770 6622
Facsimile: 01223 552610
E-mail: publications@ocr.org.uk

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	credit alternative wording / or words to that effect
ORA	or reverse argument

Available in scoris to annotate scripts:

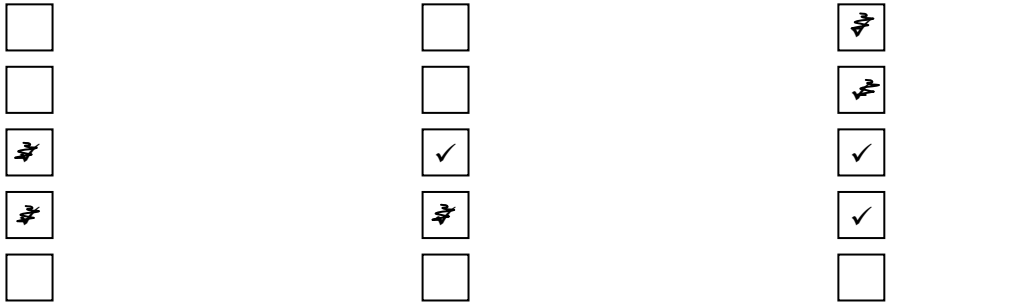
	indicate uncertainty or ambiguity
BOD	benefit of doubt
CON	contradiction
	incorrect response
ECF	error carried forward
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
	draw attention to particular part of candidate's response
NBOD	no benefit of doubt
R	reject
	correct response
	draw attention to particular part of candidate's response
^	information omitted

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 and 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	Mark	Guidance
1	(a)	(i)	gas	1	
		(ii)	2(%)	1	
	(b)		*any three points:* carbon fuel **decreases**/named example (1); because they are non-renewable/ running out/becomes scarce/polluting (1); renewables **increase** (1); because they are non-polluting/resource will not run out/ no fuel cost (1)	3	**ignore** any reference to nuclear **allow** examples, e.g. to reduce global warming **allow** correct description of changes to the diagram, e.g. the renewable bar will be bigger
	(c)		36%	1	
			Total	**6**	

Question			Answer	Mark	Guidance
2			<table><tr><th></th><th>A</th><th>D</th></tr><tr><td>An accident…</td><td></td><td>✓</td></tr><tr><td>Each tonne…</td><td>✓</td><td></td></tr><tr><td>No CO_2…</td><td>✓</td><td></td></tr><tr><td>Radioactive waste…</td><td></td><td>✓</td></tr><tr><td>The world has …</td><td>✓</td><td></td></tr></table>	2	**accept** any unambiguous correct indication of response all correct (2); 4 or 3 correct (1); less than 3 correct (0)
			Total	**2**	

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Mark</th><th>Guidance</th></tr>
<tr><td>3</td><td>(a)</td><td></td><td><table>
<tr><td>If the material is heated it will give off more radiation.</td><td></td></tr>
<tr><td>The amount of radiation emitted will decrease with time.</td><td>✓</td></tr>
<tr><td>The emitted radiation can penetrate several centimetres of metal.</td><td></td></tr>
<tr><td>The emitted radiation is absorbed by a single sheet of paper.</td><td></td></tr>
<tr><td>The emitted radiation is an ionising radiation.</td><td>✓</td></tr>
</table></td><td>2</td><td>accept any unambiguous correct indication of response</td></tr>
<tr><td></td><td>(b)</td><td>(i)</td><td><table>
<tr><td>Healthy cells will not be affected.</td><td></td></tr>
<tr><td>Diseased cells may be killed.</td><td>✓</td></tr>
<tr><td>Radioactive material cannot harm the patient.</td><td></td></tr>
<tr><td>The radiation removed ions from the cells.</td><td></td></tr>
<tr><td>The patient is contaminated by the infected material.</td><td>✓</td></tr>
</table></td><td>2</td><td>accept any unambiguous correct indication of response</td></tr>
<tr><td></td><td></td><td>(ii)</td><td>Benefit: cure of medical problem/treatment may work (1);
idea that benefit outweighs risk/ risk is small (1)</td><td>2</td><td>allow idea of destroying diseased/harmful cells
ignore it is worth taking the risk –stem of question</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>6</td><td></td></tr>
</table>

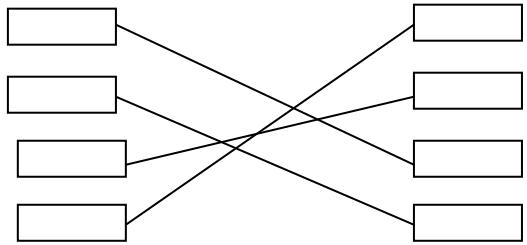
<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Mark</th><th>Guidance</th></tr>
<tr><td>4</td><td>(a)</td><td></td><td>scar on face</td><td>1</td><td>accept any unambiguous correct indication of response</td></tr>
<tr><td></td><td>(b)</td><td></td><td><table>
<tr><th>change</th><th>natural selection</th><th>selective breeding</th></tr>
<tr><td>head lice</td><td>✓</td><td></td></tr>
<tr><td>racehorses</td><td></td><td>✓</td></tr>
<tr><td>cows</td><td></td><td>✓</td></tr>
<tr><td>hens</td><td></td><td>✓</td></tr>
</table></td><td>2</td><td>accept any unambiguous correct indication of response
all 4 correct = 2
3 or 2 correct = 1</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>3</td><td></td></tr>
</table>

Question			Answer	Mark	Guidance
5	(a)		Amrit;	1	
	(b)		Caroline;	1	
	(c)		*any two from:* get eaten; (1) idea of competition; (1) lack of resources - there is not enough food/water/ nutrients/light; (1) not enough space/territory; (1) disease; (1)	2	**ignore** ideas on lack of a mate/ species extinction **ignore** adaptation **ignore** environmental change
			Total	**4**	

Question			Answer	Mark	Guidance
6	(a)		brain and spinal cord	1	need both to score mark **do not accept** spine
	(b)		detect responses;	1	need both to score mark **must be in correct order**
	(c)		circulatory ☐ digestive ☐ electrical ☐ hormonal ✓	1	**accept** any unambiguous correct indication of response more than 1 tick = 0
			Total	**3**	

Question			Answer	Mark	Guidance
7	(a)		leaves→worm → blackbird → hawk ;	1	**all correct for 1 mark**
	(b)		*any three from:* the environment changes / example of change; (1) human activity/influence / example; (1) idea of competing for resources; (1) new predator / example; (1) disease / example; (1) not enough food/water / example; (1)	3	**accept** idea of either global or local extinction e.g. climate change; flooding; habitat destruction e.g. hunting; e.g. competitor, competition for food / water / light; **allow** explosion in predator population
			Total	**4**	

Question			Answer	Mark	Guidance
8	(a)	(i)	<table><tr><td>All organic fruit is larger and looks better.</td><td></td></tr><tr><td>There are no pests on organic fruit.</td><td></td></tr><tr><td>Organic farms do not use synthetic pesticides.</td><td>✓</td></tr><tr><td>An organic farm employs fewer people.</td><td></td></tr><tr><td>Pesticides left on intensively farmed fruit may be a health hazard.</td><td>✓</td></tr></table>	2	**accept** any unambiguous correct indication of response 3 ticks deduct 1 mark 4 or 5 ticks = 0
		(ii)	example (1) explanation of benefit (1) **allow** reverse arguments	2	more hedges/unfarmed areas (1) idea of no pesticides used / biological control (1) more food for wildlife or wildlife not killed (1) more habitats for wildlife (1) **do not allow** organic farms don't use chemicals
	(b)		**Maximum of 2 points** (nitrogen/nitrates) in soil taken up in plants/lost when plants are harvested (1) soil fertility decreases (1) (nitrogen/nitrates) added to increase the yield/ more growth (1) **Maximum of 2 points** intensive farmers use synthetic fertilisers (1) organic farmers use animal and plant waste (1) idea of organic farmers use crop rotation (1)	3	**allow** reverse arguments (nitrogen/nitrates) needed for building proteins in plants **allow** alternatives to synthetic, e.g. man-made, nitrates in bags NOT nitrates on its own
			Total	**7**	

Question			Answer	Mark	Guidance
9	(a)			3	multiple lines from individual boxes will score 0 for that line all 4 lines correct = 3 marks 3 lines correct = 2 mark 2 or 1 line correct = 1 mark
	(b)		<table><tr><td>Biscuits contain starch that is digested into glucose.</td><td>✓</td></tr><tr><td>Biscuits contain starch which is digested into amino acids.</td><td></td></tr><tr><td>Biscuits contain fat which is digested into the fatty acids.</td><td></td></tr><tr><td>Sugar can be absorbed directly into the blood.</td><td>✓</td></tr><tr><td>Biscuits contain starch molecules which are too large to be absorbed.</td><td></td></tr><tr><td>Fat is digested into sugar.</td><td></td></tr></table>	2	**accept** any unambiguous correct indication of response
	(c)		3; (1) 4; (1)	2	**either order**
			Total	**7**	

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

For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored

Oxford Cambridge and RSA Examinations
is a Company Limited by Guarantee
Registered in England
Registered Office; 1 Hills Road, Cambridge, CB1 2EU
Registered Company Number: 3484466
OCR is an exempt Charity

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