OCR
RECOGNISING ACHIEVEMENT

GCSE

Additional Science A

General Certificate of Secondary Education

Unit **A152/01:** Modules B5, C5, P5 (Foundation Tier)

Mark Scheme for June 2012

Oxford Cambridge and RSA Examinations

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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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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:

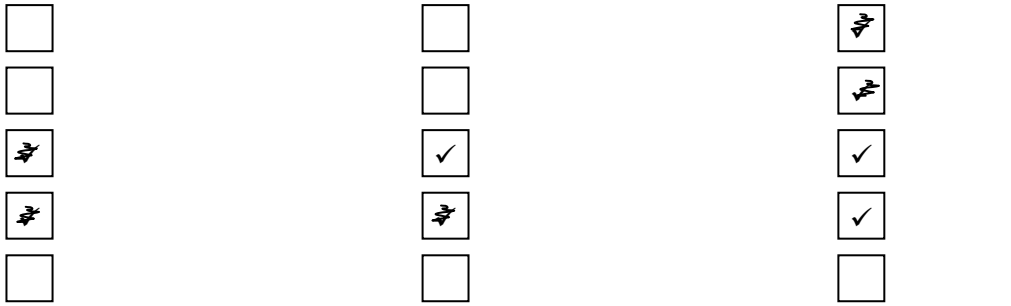
	indicate uncertainty or ambiguity
BOD	benefit of doubt
CON	contradiction
	incorrect response
ECF	error carried forward
	draw attention to particular part of candidate's response
NBOD	no benefit of doubt
R	reject
	correct response
L1 , L2 , L3	draw attention to particular part of candidate's response
^	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:

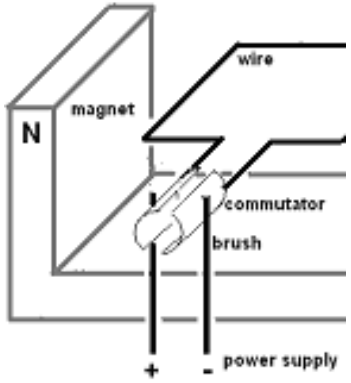
- appropriate use of correct scientific terms
- spelling, punctuation and grammar
- developing a structured, persuasive argument
- selecting and using evidence to support an argument
- considering different sides of a debate in a balanced way
- logical sequencing.

Question			Answer	Marks	Guidance
1	(a)		oxygen nitrogen	1	
	(b)		Ar CO_2	2	1 mark for each the letter C and O in CO_2 must be of a similar size subscript essential, but **accept** any indication that the subscript is intended
	(c)		small molecules; (1) weak forces between molecules; (1) idea that molecules spread; (1)	3	if the gas is not clear from the context, assume it to be nitrogen **accept** "free to move" as AW weak force far apart is not enough, further apart is 3rd MP
	(d)	(i)	28	1	
		(ii)	1120	1	**allow** ecf from **(d)(i)**
			Total	**8**	

Question			Answer	Marks	Guidance
2			gives the test for chloride and the test for iodide from the sheet (1); gives the result for one (1); give the result for the other (1)	3	nitric (acid), silver nitrate, “acid” alone is not enough Cl^- (Mary) white, I^- (Jo) yellow
			Total	**3**	

Question			Answer	Marks	Guidance
3	(a)		**[Level 3]** Identifies four hazards from the question, can state how at least two of the hazards are generated and shows who will be affected by at least one of them. Causality correct throughout. Quality of written communication does not impede communication of the science at this level. (5 – 6 marks) **[Level 2]** Identifies at least two hazards from the question and shows how at least one of them is generated. Causality correct throughout. Quality of written communication partly impedes communication of the science at this level. (3 – 4 marks) **[Level 1]** Identifies at least one hazard from the question and how it is generated, or two hazards but not how they are generated. Examples of incorrect causality. 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:** **risk how generated who injured** • shaft collapse – soft soil/ injury – miner • deep shaft – fall/dropping – miner/people on ground • lead ore dust – (as ore mined) – harms miners • lead ore fumes – from fire – harms surface workers • lead dust/fumes – from the fire – harms surface workers • heat burns – from specified hot things – harms surface workers • sulfur dioxide/acid gas – from the fire – harms surface workers **accept** 'anyone in the vicinity' of the hazard **allow** exposure to lead dust and to lead ore dust as separate hazards **allow** only one risk for unspecified dust or fumes incorrect causality is an answer such as "the fuels cause lead poisoning" "they/who (are burning and melting lead)" shows who is affected **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
	(b)	(i)	3	1	
		(ii)	2	1	
		(iii)	reduction	1	
			Total	**9**	

Question			Answer	Marks	Guidance
4	(a)		negative correlation / increasing power linked to decreasing resistance; (1) resistance of thermistor decreases with increasing temperature; (1) increasing power delivers more energy to thermistor as heat means it gets hotter; (1)	3	(description of correlation) for (1) links P to R correctly – inverse (behaviour of thermistor) for (1) links R to T correctly – inverse (causal link explained) for (1) links P to T correctly – proportional
	(b)		6 Ω (1) 1.5 W (1) (values agree with the trend shown in the table so) strengthens the correlation, (owtte) (1)	3	 must link to confidence in correlation ecf allowed for the 3rd marking point
			Total	**6**	

Question			Answer	Marks	Guidance
5			**[Level 3]** Mentions at least FOUR relevant points and adds at least TWO labels. All information in answer is relevant, clear, organised and presented in a structured and coherent format. Specialist terms are used appropriately. Few, if any, errors in grammar, punctuation and spelling. (5 – 6 marks) **[Level 2]** Mentions at least TWO of the relevant points and adds at least ONE label. For the most part the information is relevant and presented in a structured and coherent format. Specialist terms are used for the most part appropriately. There are occasional errors in grammar, punctuation and spelling. (3 – 4 marks) **[Level 1]** Clearly addresses the question, mentioning a relevant point. Has at least one label. Answer may be simplistic. There may be limited use of specialist terms. Errors of grammar, punctuation and spelling prevent communication of the science. (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** **Scientific points indicative at any level may include:** • power supply across brushes • leads to current in the wire • current/wire in magnetic field • magnetic field from N to S / across the wire • so there is a force on the wire • upwards on one side, downwards on the other • so wire loop is twisted round / spins • commutator and brushes • keep the twisting force in the same direction **Scientific labels indicative at any level may include:** • magnet • wire (loop) • commutator • brushes • power supply/battery  **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
			Total	**6**	

Question			Answer	Marks	Guidance
6	(a)		frequency	1	
	(b)	(i)	two	1	
		(ii)	A coil of wire is charged ... [ ] Changing the magnetic field inside ... [✓] Leaving a magnet in a coil ... [ ]	1	
			Total	**3**	

Question			Answer	Marks	Guidance
7	(a)		The battery ... → ... measures the rate at which charge flows in the circuit. The resistor ... → ... measures the potential difference across the battery. The ammeter ... → ... pushes charges around the circuit. The voltmeter ... → ... has a value measured in ohms.	3	correct pattern (3) two or three correct with one or two wrong (2) one correct and three wrong (1)
	(b)		doubles / doubles / ✓ doubles / no change no change / doubles no change / no change	1	
	(c)		doubles halves	1	both correct for (1)
			Total	**5**	

Question			Answer	Marks	Guidance
8	(a)		*ignore yes/no* tree shows most growth; (1) growth is linked to cell division; (1)	2	assume answer refers to tree A unless specified 2nd MP can be awarded even if wrong tree selected
	(b)		**[Level 3]** Clear description of the processes involved with the powder and the reason for being identical, in the correct order. All information in answer is relevant, clear, organised and presented in a structured and coherent format. Specialist terms are used appropriately. Few, if any, errors in grammar, punctuation and spelling. (5 – 6 marks) **[Level 2]** Description of the process may be jumbled or miss some detail. For the most part the information is relevant and presented in a structured and coherent format. Specialist terms are used for the most part appropriately. There are occasional errors in grammar, punctuation and spelling. (3 – 4 marks) **[Level 1]** Response refers only to the process or to the change in cells to form specialised tissues. Answer may be simplistic. There may be limited use of specialist terms. Errors of grammar, punctuation and spelling prevent communication of the science. (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 E** **Relevant points include:** • cutting includes meristems • meristems are a source of unspecialised cells • powder contains plant hormone • powder causes unspecialised cells to develop into roots/helps cells develop • (unspecialised cells develop) into new tissues/organs • cutting is a clone • because it has identical genes/DNA/cells as the parent • discusses the growing conditions needed to make the clone identical to the original **accept** references to named new tissues e.g.phloem, xylem **accept** references to named new organs e.g.leaves/needles **Use the L1, L2, L3 annotations in Scoris; do not use ticks.**
			Total	**8**	

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>9</td><td>(a)</td><td></td><td><table><tr><th>base</th><th>percentage present</th></tr><tr><td>A</td><td>21</td></tr><tr><td>T</td><td>21</td></tr><tr><td>C</td><td>29</td></tr><tr><td>G</td><td>29</td></tr></table></td><td>2</td><td>1 mark for each “29”

if incorrect, allow one mark for the same number in both boxes</td></tr>
<tr><td></td><td>(b)</td><td></td><td>cytoplasm</td><td>1</td><td></td></tr>
<tr><td></td><td>(c)</td><td></td><td>any three from:
test more / other people (1)
test females (1)
test older people (1)
test people with weaker muscles (1)</td><td>3</td><td>one mark for each correct suggestion
ignore incorrect suggestions
credit any suitable suggestion by the candidate
ignore statements which are too general eg ‘different lifestyles’
ignore “do the experiment again”
ignore peer review/ get other scientists to test it (this answer not specific to investigation)</td></tr>
<tr><td></td><td></td><td></td><td>Total</td><td>6</td><td></td></tr>
</table>

Question			Answer	Marks	Guidance
10	(a)		phototropism	1	
	(b)		*any three from:* increases the plant's chance of survival (1) plant to gain MORE light/energy (1) more photosynthesis occurs (1) more growth (1)	3	**ignore** "healthy" **accept** "more Sun" for more light **accept** "making more glucose" **accept** stronger
			Total	**4**	

Question			Answer	Marks	Guidance
11	(a)		46	1	
	(b)		Liza	1	
			Total	**2**	

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