OCR
RECOGNISING ACHIEVEMENT

GCSE

Additional Science A

General Certificate of Secondary Education

Unit **A215/01:** Modules B4, C4, P4

Mark Scheme for January 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	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

	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.

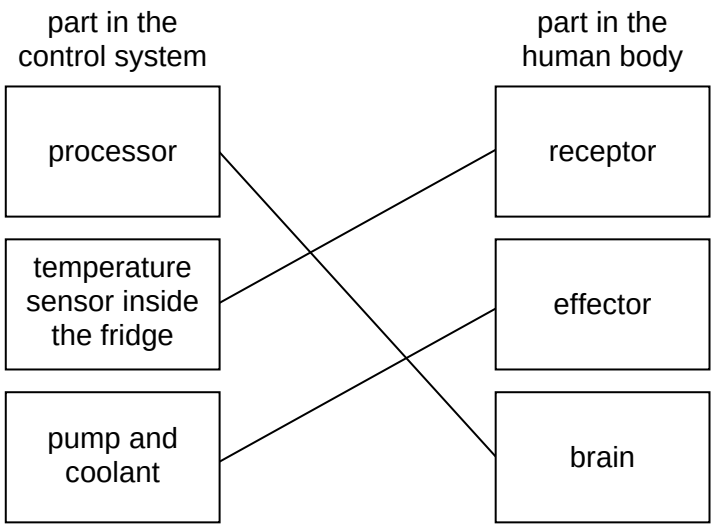
If there is a set of boxes, some of which should be ticked and others left empty, then judge the entire set of boxes.
If there is at least one tick, ignore crosses. If there are no ticks, accept clear, unambiguous indications, e.g. shading or crosses.
Credit should be given for each box correctly ticked. 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**

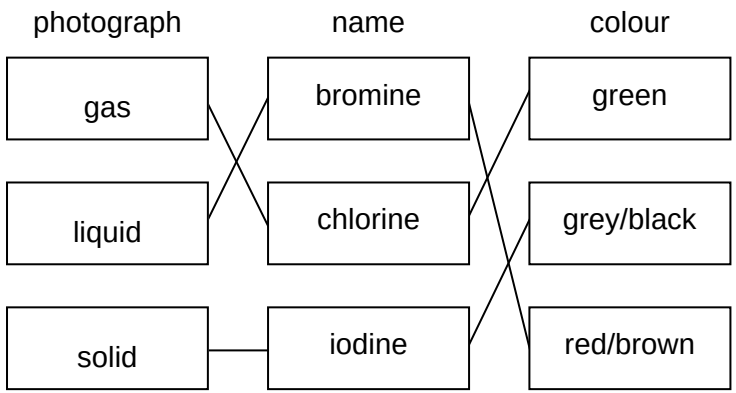
Question			Answer	Marks	Guidance
1	(a)			2	3 correct lines = 2 marks 1 or 2 correct lines = 1 mark
	(b)		blood transfers heat to her skin ✓ blood transfers heat to her brain sweat evaporates ✓ sweat condenses she shivers	2	1 mark for each correct tick if more than 2 boxes are ticked, deduct 1 mark for each wrong box.
	(c)		D C B A	2	D anywhere before C C anywhere before B B anywhere before A 3 correct = 2 marks 2 correct = 1 mark 1 correct = 0 marks
			Total	**6**	

Question			Answer	Marks	Guidance
2	(a)		1 cm	1	
	(b)		0 cm	1	
	(c)		Mark	1	
			Total	**3**	

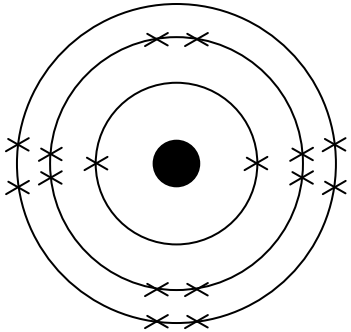
Question			Answer	Marks	Guidance
3	(a)		**any three from**: one or two marks from: • uses the term diffusion (for either process) • uses osmosis in context of movement of water **only** and max two marks out of the three for: • oxygen/water moves from high to low **concentration.** [ignore oxygen moves from low to high concn unless it contradicts the previous] • mentions partially/semi permeable membrane in context of osmosis only • osmosis direction	3	only penalise incorrect statements if they CON another statement, otherwise ignore **ignore** irrelevant statements membrane – **accept** 'little holes' assume osmosis explanation refers to the water molecules unless in the context of a solution **accept** 'high to low concentrations' ie refers to **water** concn **accept** 'low to high **solution** concn' – refers to **solution** **accept** 'dilute to high [concn]' – 'dilute' refers to solution "Both processes are diffusion, substances move from high to low concentration" = 2 'move along the concentration gradient' not enough, direction not clear.

Question			Answer	Marks	Guidance
3	(b)		more concentrated homeostasis	1	**both** required for the mark
	(c)		effect of alcohol on urine / consequence increased volume — could lead to dehydration decreased volume — could lead to rehydration	1	must only have **one** line
			Total	**5**	

Question			Answer	Marks	Guidance
4			the idea of **colour**; **comparing** colour of sun with a test on earth; idea that colours are "**unique**" to an element/if the colours **match** then there are the same elements;	3	eg comparing flame test with what is observed also give credit for any of the more advanced ideas below: spectrum/lines idea that pattern is characteristic
			Total	**3**	

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>5</td><td>(a)</td><td>(i)</td><td> 
</td><td>3</td><td>all 6 lines correct = 3
3, 4 or 5 lines correct = 2
1 or 2 lines correct = 1</td></tr>
<tr><td></td><td></td><td>(ii)</td><td><table><tr><td>bleaches it</td><td>✓</td></tr><tr><td>burns it</td><td></td></tr><tr><td>evaporates it</td><td></td></tr><tr><td>neutralises it</td><td></td></tr></table></td><td>1</td><td></td></tr>
<tr><td></td><td></td><td>(iii)</td><td><table><tr><td>it attracts bacteria</td><td></td></tr><tr><td>it kills bacteria</td><td>✓</td></tr><tr><td>it neutralises bacteria</td><td></td></tr><tr><td>it repels bacteria</td><td></td></tr></table></td><td>1</td><td></td></tr>
<tr><td></td><td>(b)</td><td>(i)</td><td>sodium + bromine ➔ sodium bromide</td><td>1</td><td>sodium and bromine in either order
sodium bromide must end in ‘ide’</td></tr>
</table>

Question			Answer	Marks	Guidance
5	(b)	(ii)	**NABR** **NaBr** **NabR** **nABr**	1	
		(iii)	700-760	1	
			Total	**8**	

Question			Answer	Marks	Guidance
6	(a)		They have different numbers of protons. ✓ They have different numbers of neutrons. They have different relative atomic masses. They have different sizes.	1	
	(b)			1	6 in the outer shell, in any arrangement 8 in the middle shell, any arrangement **accept** dots, or 'e', instead of crosses, but candidate must use the same symbol for all the electrons
	(c)		The ion has one electron more than the atom. ✓ The ion has one electron less than the atom. The ion has one electron shell more than the atom. The ion has one electron shell less than the atom.	1	
			Total	**3**	

Question			Answer	Marks	Guidance
7	(a)		35 (m/s)	1	**accept** from 34.0 to 36.0
	(b)		gravitational potential energy decreases; kinetic energy increases; total energy decreases;	3	PE is transferred to KE for 2 marks **accept** stays the same
	(c)		<table><tr><td>His weight increases.</td><td></td></tr><tr><td>His weight decreases.</td><td></td></tr><tr><td>Air resistance increases.</td><td>✓</td></tr><tr><td>Air resistance decreases.</td><td></td></tr></table>	1	
			Total	**5**	

Question			Answer	Marks	Guidance
8	(a)		size: 1000 [N] direction: backwards/opposite direction indicated reason: gas and rocket are an interaction **pair** (owtte) / idea of opposing **pair** of forces	3	**accept** "same" **accept** "out the back", "left" or "west" **accept** force on rocket from gas [is equal] and **opposite** to force on gas from rocket / momentum change of gas equal and opposite to momentum change of rocket **ignore** arguments about balanced forces giving a steady speed
	(b)		1000 × 10	1	
	(c)		C	1	
			Total	**5**	

Question			Answer	Marks	Guidance
9	(a)		<table><tr><td>It transfers kinetic energy from the car to Jack.</td><td></td></tr><tr><td>It increases the time for which forces act on Jack.</td><td>✓</td></tr><tr><td>It provides a counter force to the force from the wall.</td><td></td></tr><tr><td>It redirects the force from the wall towards the ground.</td><td></td></tr></table>	1	
	(b)		7.5 (m/s)	1	
	(c)		force Work	2	
			Total	**4**	

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