OCR
RECOGNISING ACHIEVEMENT

GCSE

Additional Science A

General Certificate of Secondary Education

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

Mark Scheme for January 2011

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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Guidance for Examiners

Additional Guidance within any mark scheme takes precedence over the following guidance.

1. Mark strictly to the mark scheme.

2. Make no deductions for wrong work after an acceptable answer unless the mark scheme says otherwise.

3. Accept any clear, unambiguous response which is correct, eg mis-spellings if phonetically correct (but check additional guidance).

4. Abbreviations, annotations and conventions used in the detailed mark scheme:

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

eg mark scheme shows 'work done in <u>lifting</u> / (change in) <u>gravitational</u> potential energy' (1)
"work done" = 0 marks
"work done lifting" = 1 mark
"change in potential energy" = 0 marks
"gravitational potential energy" = 1 mark

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

6. 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.

   The example below illustrates how to apply this principle to an objective question.

eg for a one mark question, where ticks in boxes 3 and 4 are required for the mark

Put ticks (✓) in the two correct boxes.	Put ticks (✓) in the two correct boxes.	Put ticks (✓) in the two correct boxes.
☐	☐	☒
☐	☐	☒
✓	☒	✓
☒	☒	✓
☐	☐	☐
This would be worth zero marks.	*This would be worth one mark.*	*This would be worth one mark.*

7. 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, eg 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.

8. 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, eg 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.

eg if a question requires candidates to identify a city in England, then in the boxes

Edinburgh	
Manchester	
Paris	
Southampton	

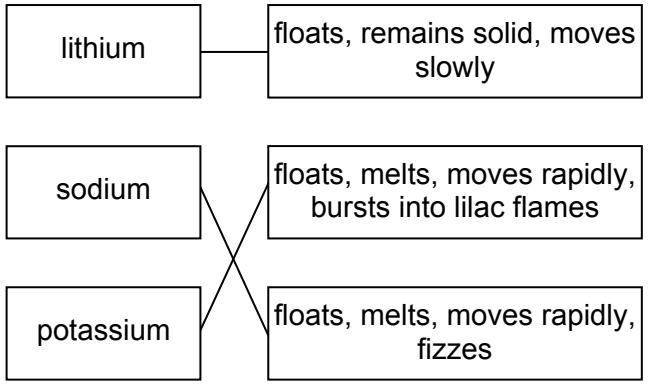
the second and fourth boxes should have ticks (or other clear indication of choice) and the first and third <u>should be blank</u> (or have indication of choice crossed out).

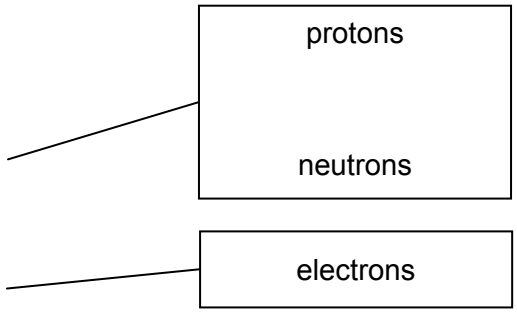
Edinburgh			✓			✓	✓	✓	✓	
Manchester	✓	×	✓	✓	✓				✓	
Paris				✓	✓		✓	✓	✓	
Southampton	✓	×		✓		✓	✓		✓	
Score:	**2**	**2**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**NR**

Question			Expected Answers	Marks	Additional Guidance
1	(a)		homeostasis (1)	[1]	
	(b)		brain (1) skin (1) heat stroke (1)	[3]	must be in correct order
	(c)		**any two from:** hot because of (waste heat from) exercise; dry because of dehydration / evaporation of all sweat / water loss; idea that sweating results in cooling; evaporation (of sweat) causes cooling; raised temperature increases (waste) heat loss by radiation;	[2]	
			Total	[6]	

Question			Expected Answers	Marks	Additional Guidance
2	(a)		**solution** | B | strong sugar A | distilled water C | weak sugar	[2]	three correct = 2 marks one or two correct = 1 mark **accept** correct description instead of letters
	(b)		… partially permeable. ☑ (1) ☐ ☐	[1]	
	(c)		osmosis (1)	[1]	
			Total	[4]	

Question			Expected Answers	Marks	Additional Guidance
3	(a)		**any two from:** the other chemical / starch is the wrong shape / has to be the right shape; to fit together; mention of active site; mention of lock and key model;	[2]	**accept** enzyme needs to be the right shape
	(b)	(i)	C (1)	[1]	if answer line left blank check for indication on diagram
		(ii)	The frequency of collisions increases. ☑ (1) ☐ ☐ ☐ ☐	[1]	
			Total	[4]	

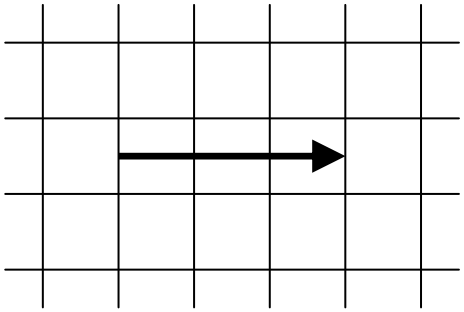
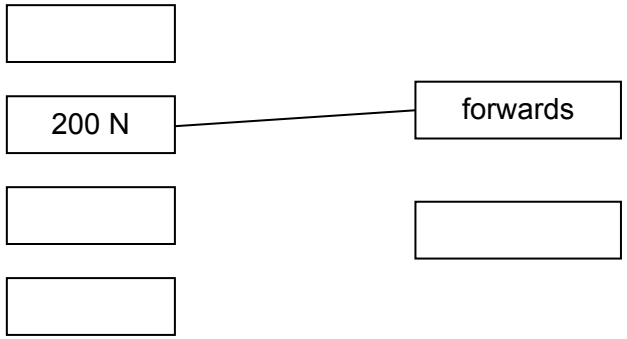
Question			Expected Answers	Marks	Additional Guidance
4	(a)		<table><tr><th>symbol</th></tr><tr><td>Li</td></tr><tr><td>Na</td></tr><tr><td>K</td></tr></table>	[1]	the 'L' in Li must be a capital, the i must be lower case, so look for the dot the 'K' must be a capital, not just a large lower case letter (k), so look for absence of loop
	(b)	(i)		[2]	all three elements joined correctly = 2 marks two or one elements joined correctly = 1 mark
		(ii)	sodium hydroxide and hydrogen ☐ sodium hydroxide and hydrogen ☑ (1) sodium hydroxide and hydrogen ☐ sodium hydroxide and hydrogen ☐	[1]	
	(c)		NaCl (1)	[1]	do **not** penalise poor element symbols look for N, a, C and l in correct order (upper or lower case) with no numbers as superscripts or subscripts. **accept** Na + Cl = NaCl
	(d)		any discussion of colour or spectrum (of light emitted) (1)	[1]	**not** brightness **accept** any colour
	(e)		francium (1)	[1]	**accept** Fr as symbol for francium **accept** 'the bottom one'
			Total	[7]	

Question			Expected Answers	Marks	Additional Guidance
5	(a)	(i)		[1]	protons and neutrons either way round
		(ii)	11 (1)	[1]	
		(iii)	Group 1 (1) level of response for remaining 2 marks [2 marks] realises that the number of outer electrons is the same as the group number [1 mark] any discussion of electrons	[3]	**ignore** mention of protons
		(iv)	It loses an electron. ✓ (1) ☐ ☐ ☐	[1]	

Question			Expected Answers	Marks	Additional Guidance
5	(b)		☐ 20 ☑ (1) ☐ ☐	[1]	
			Total	[7]	

6	(a)		C (1)	[1]	if answer line left blank, check for indication on diagram
	(b)		speeds up at start of journey / slows down at end of journey / stops at some point in journey (1) speed would be below 90 kph for part of journey so must be above at other times (to keep average at 90 kph) (1)	[2]	look for any sensible reason why the speed at some time is below 90 kph (1) look for idea of higher than average speed at some time to compensate for lower speed at other times (1)
	(c)		Bess (1)	[1]	
	(d)		+15 m (1)	[1]	
			Total	[5]	

Question			Expected Answers	Marks	Additional Guidance
7	(a)		Marco's hand backwards	[1]	both required for 1 mark
	(b)		☐ Some work is done on the water. ☑ (1) ☐ ☐	[1]	
	(c)		kinetic (energy) (1) energy changes / increases / decreases (1) energy increases with increasing speed / energy decreases with decreasing speed / transfers to heat energy (through friction) (1)	[3]	
			Total	[5]	

Question			Expected Answers	Marks	Additional Guidance
8	(a)			[1]	look for an arrow to the right of length 3 squares anywhere on the grid **accept** arrow to the left **accept** arrow of correct length which does not start on a grid line
	(b)			[1]	
	(c)		The vertical momentum … ✓ (1)	[1]	
	(d)		900 (1)	[1]	
			Total	[4]	

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