OCR
RECOGNISING ACHIEVEMENT

GCSE

Additional Science A

General Certificate of Secondary Education **A216/02**

Unit 2: Modules B5, C5, P5 (Higher Tier)

Mark Scheme for June 2010

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 pupils 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:

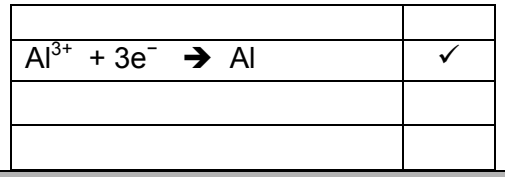
OCR Publications
PO Box 5050
Annesley
NOTTINGHAM
NG15 0DL

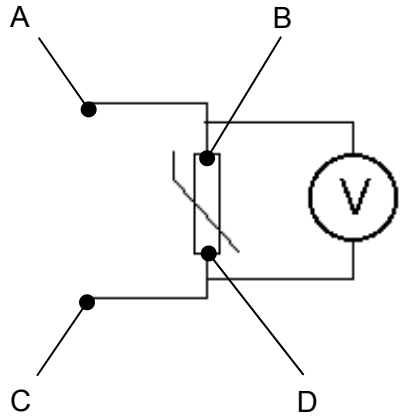
Telephone: 0870 770 6622
Facsimile: 01223 552610
E-mail: publications@ocr.org.uk

Question			Expected Answers	Marks	Additional Guidance
1	a		Where is the salt? Realises that the rocks/ mountains / ground / lithosphere contain the salt or salts or minerals (1)	[3]	'Chemicals' not enough for the 'salt' marking point. Must strongly infer that the salt is in the ground to start with. If ground not mentioned, allow any mention of salt in streams/rivers – assume from ground unless candidate contradicts that assumption. **allow** "Rivers pick up salt" for salt in ground. **not** "salt travels down rivers", "rain picks up salt" - not enough
			How does [the salt] get into the water? Describes extraction of material from rocks by water e.g. salt dissolves / chemicals washed out of rocks (1)		The extraction must be discussed, however briefly. "The water flows over salty ground", "rains onto cliffs and picks up salts" both only get the first mark
			What happens to the sea? links evaporation to water or evaporation to salt left behind /salt doesn't evaporate [any context must be suitable] (1)		Any context must imply that water evaporates FROM the sea. **ignore** 'Sea evaporates' we are NOT looking for a description of the water cycle The second marking point will often include the first, and be worth two marks "salt washed out of rocks" = 2 "chemicals washed out of rocks" = 1 ie not 'chemicals'

Question			Expected Answers	Marks	Additional Guidance
1	b		small molecules weak forces of attraction	[2]	mark each column separately, 1 mark for each correct column A column is correct if the correct box, and no other, is indicated, though it may have more than one line attached to it
	c		CH_4 (1)	[1]	
			Total	[6]	

2	**a**		Danielle (1) Andy (1)	**[2]**	either order **accept** if marked on the diagram
	b		realises the major factor is weight/mass	**[1]**	**accept** "Aluminium/cable is lighter" **accept** "twice the conductivity for the same weight" If the candidate gives several reasons, look where the emphasis lies. If in doubt, lighter should be the first in the list. So **ignore** "and it is lighter"
	c		40% (1)	**[1]**	
	d		...to melt a compound ☐ ...to purify a compound ☐ ...to make a compound ☐ ... to decompose a compound ☑ (1)	**[1]**	
	e		☐ ☐ ☐ Oxygen...positive... ☐ ☐ ...formed...positive... ☐ ☐ ☐	**[2]**	mark each column separately A column is correct if the correct box, and no other, is indicated, though it may have more than one line attached to it

Question			Expected Answers	Marks	Additional Guidance
2	f			[1]	
			Total	[8]	

3	a		resistance (1) temperature (1)	[2]	
	b		9 Ω (1)	[1]	
	c			[1]	look for V in a circle [not a square] with lines to either end of thermistor [accept the 'V' on its side] one end connected anywhere between A and B the other end connect anywhere between C and D The voltmeter maybe 'inside' the circuit **accept** diagram at bottom of page If there is an answer in both positions, neither crossed out, mark the top one only. Candidates answer should be on the printed diagram. **IF NOT**, they may have drawn another diagram which can score the marks.
			Total	[4]	

Question			Expected Answers	Marks	Additional Guidance
4	a		voltage (1) … current (1) [in that order]	[2]	**allow** resistance for the second answer
	b		<table><tr><th>switch</th><th>ammeter reading</th></tr><tr><td>open</td><td>1</td></tr><tr><td>closed</td><td>2</td></tr></table>	[1]	beware –**BOTH** responses needed for the mark
	c		First marking point Calculation, independent of reasoning 6/12=0.5 , 6/0.5=12, 12x0.5=6 OR 3/6 = 0.5, 3/0.5 = 6, 6x0.5 = 3 No other calculations are acceptable Second marking point [mark independently] Any one of the following Correct equation written in symbol or word form I=V/R V=IR R=V/I [in series], current must be same through both resistors [components] / voltage split across the resistors indicates that "12" is a measure of [total] resistance or that the pd across one resistor is 3 [volts]	[2]	**accept** the calculation in words "6 is half of 12, so it's 0.5" any statement about current being split or shared between resistors cannot get the second marking point. in series, so charge must be same through both resistors BOD **accept** any reference to "12Ω", "resistors add up to 12",
			Total	[5]	

5	a		discusses magnetic field (1) which is changing (1) uses the term 'induces' or shows causal link between changing magnetic field and voltage (1)	[3]	**accept** any reference to magnetism e.g. 'electromagnet' **ignore** 'because transformers don't work on dc'
	b		115 V (1)	[1]	
	c		16.8 kWh (1)	[1]	
			Total	[5]	

Question			Expected Answers	Marks	Additional Guidance
6	a		**any three from the following:** *Clone* - the new plant/cutting/it is a clone *Hormone* - Links hormone/auxin to growth or development [of any part of the plant] *unspecialised cells* - infers that these are the cells which actually develop/ change/ specialise/ differentiate [into something else] xylem cells – infers that these develop from the unspecialised cells	**[3]**	IGNORE ANY INCORRECT STATEMENTS, unless they actually contradict a correct statement. Eg **ignore** 'cutting is a clone of the DNA' **ignore** "They clone cells that are needed" **ignore** 'the hormones in the plant', "the cutting gives off a hormone", "hormone stimulates plant" 'auxin is a hormone' – not enough for a mark the hormone auxin helps the plant respond to light. BOD for growth **accept** 'unspecialised cells grow into any cell' **ignore** 'unspecialised cells grow' **ignore** "all plant cells are unspecialised" **ignore** 'the unspecialised cells in the cutting means it can grow into something else" **ignore** 'meristem' "unspecialised cells develop into xylem cells" = 2 "[meristem cells] develop into xylem cells" = 1
	b		mentions light/photosynthesis	**[1]**	**ignore** any mention of 'Sun', but accept 'sunlight' **reject** incorrect statements, e.g.Plant gets its food from the sunlight
			Total	**[4]**	

Question			Expected Answers	Marks	Additional Guidance
7	a		cells divide ✓ (1) chromosomes are copied ☐ number of organelles increases ☐ number of nuclei stays the same ☐ copies of chromosomes separate ✓ (1)	[2]	If more than two boxes ticked deduct a mark for each incorrect response. Candidates may not score less than zero.
	b	i	gametes (1)	[1]	**accept** sex cells, egg (cell), sperm (cell), haploid, reproductive cells **reject** zygote, embryo If more than one answer – mark the first one
		ii	The larger cell has more... ☐ The smaller cell has more... ☐ They have the same number... ✓ (1) The first cell to form has more... ☐	[1]	
	c	i	All genes are activated. ☐ All genes are inactivated. ☐ All active genes are inactivated. ☐ Some inactive genes are reactivated. ✓ (1)	[1]	

Question			Expected Answers	Marks	Additional Guidance
7	c	ii	Stem cells have twice... ☐ Stem cells are specialised. ☐ Stem cells are unspecialised. ☑ (1) Stem cells have half... ☐	[1]	
			Total	[6]	

Question			Expected Answers	Marks	Additional Guidance
8	a		T G T C A	[1]	
	b		to make...different ☐ to hold the strands...together ✓ to allow exact copies... ✓ to allow proteins to join... ☐ ...code for a different amino acid ☐	[1]	beware – one mark for **BOTH** answers
	c		D A E F uses D, A, E in any order = 1 mark order correct = 1 mark	[2]	
			Total	[4]	

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

OCR Customer Contact Centre

14 – 19 Qualifications (General)
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