

Additional Science B

General Certificate of Secondary Education

Unit **B623/01**: Modules B3, C3, P3

Mark Scheme for June 2011

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.

© OCR 2011

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

- 1 The **Abbreviations, annotations and conventions** used in the detailed Mark Scheme are:

/	= alternative and acceptable answers for the same marking point
(1)	= separates marking points
not	= answers which are not worthy of credit
reject	= answers which are not worthy of credit
ignore	= statements which are irrelevant
allow	= answers that can be accepted
()	= words which are not essential to gain credit
<u> </u>	= underlined words must be present in answer to score a mark
ecf	= error carried forward
AW	= alternative wording
ora	= or reverse argument

Question		Expected Answers	Marks	Additional Guidance
1	a	3 rd box / fast growth (1) 4 th box / thick wool (1)	2	three boxes ticked with two correct for one mark four / five boxes ticked with two correct for zero marks
	b	i	1	no (no mark) have genes from both parents / have two parents / has a mother and a father / are result of sexual reproduction (1) yes = 0 marks allow because to be a clone they have the same DNA / genes / genetic code allow they have different DNA / genes / genetic code
		ii	1	yes (no mark) (could be) identical twins (1) no = 0 marks ignore just 'twins' allow higher level answers e.g. monozygotic twins / formed from same egg / description of embryo splitting
	c	i	1	genetic engineering / genetic modification (1) allow GM / gene engineering / gene modification ignore gene transformation
		ii	1	fast(er) (1) allow idea that is more precise or accurate / just one characteristic transferred allow more certain of outcome e.g. know what features the sheep will have ignore you get exactly what you want not faster growth rate
Total			6	

Question			Expected Answers	Marks	Additional Guidance
2	a	i	0 (to) 3 (1)	1	both answers needed for 1 mark
		ii	21(to) 24 (1)	1	both answers needed for 1 mark
	b		3 rd box / infancy (1)	1	more than one box ticked scores zero
	c		fertilisation / (sexual) reproduction (1) division (1) differentiation / specialisation (1)	3	allow fusing ignore 'conceiving' not 'asexual reproduction' allow splitting / multiplication allow higher level answers e.g. mitosis but not meiosis ignore growth
			Total	6	

Question		Expected Answers	Marks	Additional Guidance
3	a	55 (°C) (1)	1	allow answer in range 54-56
	b	i	1	allow active transport not osmosis allow correct definitions of the processes
		ii	1	ignore thick ignore reference to time without mention of size
		iii	1	allow ileum / villi not large intestine
	c	i	1	<u>plasma</u> (1)
		ii	3	USE TICKS FOR THIS QUESTION allow contracts / pushes ignore moves / takes / beats allow right atrium / ventricle to lungs allow left atrium / ventricle to body
			8	Total

Question		Expected Answers	Marks	Additional Guidance
4	a	Be (and) F (1) or Sr (and) I (1)	1	both answers needed in either order for one mark allow beryllium (and) fluorine ignore BE / be / f allow strontium (and) iodine ignore SR / sr / i
	b	F (1)	1	allow fluorine ignore fluoride ignore f
	c	Ar (1)	1	allow argon ignore ar / AR
	d	I (1)	1	allow iodine ignore iodide ignore i
		Total	4	

Question			Expected Answers	Marks	Additional Guidance
5	a	i	(iron is) a poor electrical conductor (1)	1	allow because of its electrical conductivity not references to high density / high melting point ignore poor conductor unless qualified by electrical ignore poor thermal conductor
		ii	(aluminium has) a low(er) density (than copper) (1)	1	ignore references to electrical conductivity not references to melting point / thermal conductivity ignore weighs less / lighter
	b		regular (1) metallic (1) superconductors (1)	3	
			Total	5	

Question	Expected Answers	Marks	Additional Guidance
6	<p> n u c l e u s (1) p r o t o n (1) i o n (1) e g a t v e (1) </p>	4	<p>answers on crossword take precedence allow answers in clues if answer not in crossword allow incorrect spelling</p> <p> 2 across – nucleus (1) 3 across – proton (1) 5 across – ion (1) 4 down – negative (1) </p>
	Total	4	

Question		Expected Answers	Marks	Additional Guidance
7	a	lithium (chloride) (1) (and) potassium (chloride) (1)	2	either order
	b	i	1	ignore just 'alkali'
		ii	2	allow are reactive metals ignore just 'reactive' allow to keep away from air allow to keep away from water ignore react with liquids allow so they will not react with water and air (2) allow idea they react with moist air / need to be kept away from moist air (2)
		Total	5	

Question		Expected Answers	Marks	Additional Guidance
8	a	CuCO_3 (1)	1	not $\text{CuCO}_3 \rightarrow \text{CuO} + \text{CO}_2$ allow copper carbonate
	b	5 (1)	1	
		Total	2	

Question			Expected Answers	Marks	Additional Guidance
9	a	i	gravity / weight (1)	1	allow gravitational (pull) ignore mass
		ii	increases / gets faster / accelerates / AW (1)	1	allow speeds up
	b	i	drag / air resistance / (air) friction (1)	1	allow wind resistance ignore just 'resistance' ignore upthrust / thrust
		ii	distance / length / (idea of) height fallen (1) time (1)	2	either order allow correct units of distance e.g. metres ignore instruments e.g. ruler allow how far he has fallen / height of aeroplane allow correct units of time e.g. seconds ignore instruments e.g. stop clock allow how long it takes
Total				5	

Question			Expected Answers	Marks	Additional Guidance
10	a	i	B (1)	1	if answer line is blank allow correct answer ticked circled or underlined
		ii	A (1)	1	if answer line is blank allow correct answer ticked circled or underlined
	b	i	changetime (1)	1	both needed allow increase / decrease / AW for change allow any correct unit of time not t^2 ignore t
		ii	6000 (N) (2) but if answer is incorrect 1200 x 5 (1)	2	
		iii	1600000 (J) (2) but if answer is incorrect 8000 x 200 (1)	2	
			Total	7	

Question	Expected Answers	Marks	Additional Guidance
11	<u>hybrid</u> (1) <u>diesel</u> (1) small (engine size) (1)	3	USE TICKS FOR THIS QUESTION maximum three marks allow idea of smaller engine size e.g. 'decrease engine size' allow higher level answers e.g. less energy wasted in braking (1) electric motor used at low speeds or when stopped (1) <u>hybrid</u> engine operates closer to maximum efficiency (2) <u>hybrid</u> engines are small because of electric motor assist (3)
	Total	3	

Question			Expected Answers	Marks	Additional Guidance
12	a	i	any one from less mass / weight (1) (more) streamlined / reference to absence of roof box (1)	1	needs comparison to be made allow lighter / not as heavy ignore smaller allow more aerodynamic / smaller surface area / less air resistance / less drag allow answers about style of driving e.g. (idea of) higher driving force / pressing harder on accelerator
		ii	greater mass (1)	1	needs comparison to be made allow greater weight / heavier ignore bigger ignore has more force (pulling it down)
		iii	joule (1)	1	if answer line is blank allow correct answer ticked circled or underlined
	b		increases by four / quadruples / x4 (1)	1	ignore just 'increases'
	c		C (1)	1	if answer line is blank allow correct answer ticked circled or underlined
			Total	5	

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

© OCR 2011