



GCSE

Additional Science B

General Certificate of Secondary Education

Unit **B623/01**: Modules B3, C3, P3 (Foundation Tier)

Mark Scheme for June 2012

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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.

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Annotations used in Scoris

Annotation	Meaning
	Correct response
	Incorrect response
	Benefit of the doubt
	Benefit of the doubt <u>not</u> given
	Error carried forward
	Information omitted
	Ignore
	Reject
	Contradiction

Subject-specific Marking Instructions

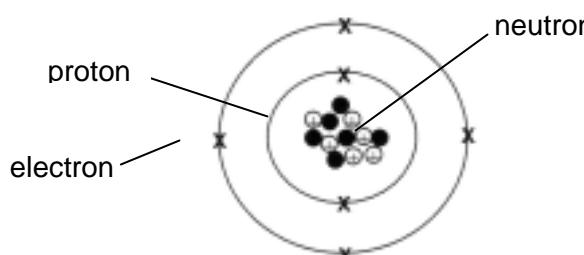
Abbreviations, annotations and conventions used in the detailed Mark Scheme.

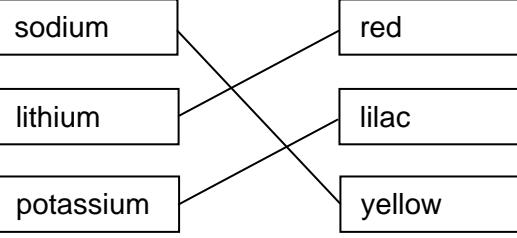
- / = alternative and acceptable answers for the same marking point
- (1) = separates marking points
- allow** = answers that can be accepted
- not** = answers which are not worthy of credit
- reject** = answers which are not worthy of credit
- ignore** = statements which are irrelevant
- () = words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

Question		Answer	Marks	Guidance
1	(a)	arteries (1)	1	allow the heart (1) allow named arteries e.g.aorta or coronary artery (1) ignore references to veins or capillaries
	(b)	$\frac{(40 \times 8.5)}{100} = 3.4 \text{ (mmol) (1)}$ but $(8.5 - 3.4) = 5.1 \text{ (mmol) (2)}$ but $(5.7 - 5.1) = 0.6 \text{ (mmol) (3)}$ but 0.6 (mmol per litre of blood) on its own (3)	3	allow ecf over the 3 steps allow $\frac{60 \times 8.5}{100} = 5.1$ (2)
	(ii)	DNA (1)	1	allow nucleic acid / bases / ACTG (1) not chromosomes
	(c)	idea of movement (of a substance or solute) from a high to a low concentration (1)	1	allow goes from a high concentration to a low concentration (1) ignore breaking down from a high to a low concentration ignore references to membranes not movement of cells
		Total	6	

Question		Answer	Marks	Guidance
2	(a)	<p>(C)</p> <p>B</p> <p>A</p> <p>D</p> <p>E</p>	2	<u>all</u> in correct order (2) <u>a run of 2</u> in correct order (1) otherwise (0)
	(b) (i)	idea of producing different types of cells or specialised cells to do a job (1)	1	<u>allow</u> range of cells made (1) <u>allow</u> a cell gets given a different job (1) <u>ignore</u> cells change <u>ignore</u> new cells are made
	(ii)	larger animals have to have longer period (for cell division to produce functional organs) / ORA (1)	1	<u>ignore</u> it depends on the size of the animal <u>ignore</u> references to complexity or numbers of cells
	(c) (i)	placenta (1)	1	<u>ignore</u> umbilical cord
	(ii)	red (blood) cell (1) haemoglobin (1)	1	<u>allow</u> RBC (1)
	(d)	foetus absorbs food from mother's blood / small intestine doesn't digest or absorb or break down food in foetus (1)	1	<u>allow</u> gets food from mother's blood (1) <u>allow</u> foetus absorbs food from mother or placenta or through umbilical cord (1) <u>allow</u> idea that foetus does not need to digest food as mother does it (1) <u>allow</u> the small intestine is used to break down food and the baby does not eat before birth (1)
		Total	7	

Question		Answer	Marks	Guidance
3	(a)	asexual (1)	1	ignore cloning
	(b)	<p>carbon dioxide <input type="checkbox"/></p> <p>food <input type="checkbox"/></p> <p>gravity <input checked="" type="checkbox"/></p> <p>oxygen <input type="checkbox"/></p> <p>salt <input type="checkbox"/></p>	1	multiple ticks scores 0
	(c)	<p>for growth / to increase in size (1)</p> <p>replacement of worn out / old cells (1)</p> <p>repair to damaged tissue (1)</p>	3	allow for cell differentiation (1) allow to make new cells or more cells (1) ignore mitosis and meiosis ignore reproduction
	(d)	<u>modification</u> (1) <u>insert</u> (1)	2	
		Total	7	

Question		Answer	Marks	Guidance
4	(a) (i)		2	all 3 correct – 2 marks 1 or 2 correct – 1 mark ignore positive, negative and neutral
	(ii)	12 / twelve (1)	1	
	(b)	gas (1)	1	allow vapour (1)
	(c)	silicon / germanium / tin / lead (1)	1	allow correct symbol, i.e. Si / Ge / Sn / Pb (1)
		Total	5	

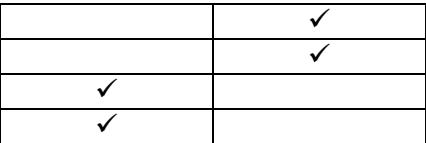
Question		Answer	Marks	Guidance
5	(a)	alkali metals (1)	1	allow alkali(s) or alkaline (1)
	(b)	any two from: (stops) reaction with air or oxygen / (stops) contact with air or oxygen / sodium reacts with air or oxygen (1) (stops) reaction with water or moisture / (stops) contact with water or moisture / sodium reacts with water or moisture (1) very reactive (1)	2	allow reacts with moist air (2) allow reacts violently with water / air / oxygen (2) allow reacts quickly with water / air / oxygen (2) ignore does not react with oil
	(c)	sodium – yellow lithium – red potassium - lilac	2	all 3 correct – 2 marks 1 or 2 correct – 1 mark 
		Total	5	

Question		Answers	Marks	Guidance
6	(a)	state of chlorine – gas (1) colour of bromine – red / brown / orange / yellow (1)	2	allow any combination of red, brown, orange and yellow e.g. orange-red or red-brown (1) allow rusty red or foxy red (1) not combinations where one of the colours is incorrect e.g. black-brown ignore references to pale or dark
	(b)	making plastics (1)	1	allow correct answer ticked, circled or underlined in list if answer line is blank
	(c)	bromine + sodium iodide \rightarrow iodine + sodium bromide (1)	1	allow = instead of \rightarrow not and / & / instead of + allow correct formulae (i.e. case and subscripts must be correct) but equation does not need to balance e.g. $\text{Br}_2 + \text{NaI} \rightarrow \text{I}_2 + \text{NaBr}$ (1) allow mix of correct formulae and words not $\text{Br} + \text{NaI} \rightarrow \text{I} + \text{NaBr}$
		Total	4	

Question		Answer	Marks	Guidance
7	(a)	silver (1)	1	allow Ag (1)
	(b)	(£)5400 (1)	1	
	(c)	metals have strong metallic bonds (1)	1	<input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> <input type="checkbox"/>
	(d)	electrolysis (1)	1	allow correct answer ticked, circled or underlined in list if answer line is blank
	(e) (i)	4 / four (1)	1	
	(ii)	iron, carbon and oxygen (1)	1	all 3 names required for mark not Fe, C and O
		Total	6	

Question		Answer	Marks	Guidance
8	(a)	(i) C (1)	1	more than one letter scores zero. If answer line is blank allow correct answer ticked underlined or circled
		(ii) D (1)	1	more than one letter scores zero. If answer line is blank allow correct answer ticked underlined or circled
	(b)	(i) distance / length (of tunnel) (1)	1	
		(ii) measuring tape / trundle wheel (1)	1	allow or tape measure (1) allow metre wheel or measuring wheel (1) allow a pedometer (1) ignore metre rule ignore stopwatch
	(c)	4500 (N) (3) but if answer incorrect correct calculation of acceleration as $5(\text{m/s}^2)$ (2) if incorrect $\frac{20}{4}$ (1) or (force =) calculated acceleration $\times 900$ (1)	3	allow ecf for incorrectly calculated acceleration e.g. $a = 4/20 = 0.25$ then $F = 900 \times 0.25 = 225$ scores 1 allow ($F =$) ma or (force =) mass \times acceleration (1) not 900×20 or 900×4
	(d)	area under graph (1)	1	allow correct area calculation $\frac{1}{2} \times 20 \times 4 = 40$ (1) allow multiply the speed by 4 and then half it (1)
		Total	8	

Question		Answer	Marks	Guidance
9	(a)	weight (1) downward (force) (1) increasing speed (1)	3	allow gravity [1] not mass on its own [0] but allow the idea of gravity acting on the mass [1] ignore gravitational or potential energy allow towards the ground (1) allow it reaches terminal velocity or terminal speed (1) ignore it goes fast
	(b)	kinetic (energy) (1)	1	allow KE (1) allow movement energy or thermal energy or heat energy (1) ignore sound energy
		Total	4	

Question		Answer	Marks	Guidance
10	(a)	distance travelled from when the brakes are applied (to when the car stops) / AW (1)	1	must be sure candidate is referring to distance not time not how long it takes from when the brakes are applied to when the car stops or how long it takes to brake allow how far a car travels after applying the brakes (1)(limit of acceptability)
	(b)	idea that (stopping distance is) braking distance + thinking distance (1)	1	must be sure candidate is referring to distance not time
	(c)	 (2)	2	all correct (2) any two horizontal lines correct (1)
	(d)	any two from: brakes (1) airbags (1) seat belts (1) crumple zones (1) collapsing steering column (1) named padded area in car (1)	2	ignore braking allow headrest (1) allow bumpers or car bonnet (1) ignore safety cage
		Total	6	

Question		Answer	Marks	Guidance
11	(a)	John (1)	1	If answer line is blank allow correct answer ticked, underlined or circled
	(b)	time (1)	1	allow how long they work for (1)
		Total	2	

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