

Additional Science B

General Certificate of Secondary Education

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

Mark Scheme for January 2013

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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

Annotation	Meaning
	Correct response
	Incorrect response
	Benefit of doubt
	Benefit of the doubt not given
	error carried forward
	Omission Mark
	Ignore
	reject
	contradiction

Subject-specific Marking Instructions

/	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	alternate wording
ora	or reverse argument

Question		Answer	Marks	Guidance
1	(a)	sperm (1)	1	
	(b)	fertilisation / to fertilise an egg / join with an egg / carries genes to the egg / carries chromosomes to the egg / carries DNA to the egg (1)	1	allow to fertilise eggs ignore to swim to an egg / reproduction / to make a baby
	(c)	tail for swimming / tail for moving (1); nucleus to carry genes / nucleus to carry chromosomes / nucleus to carry DNA (1)	2	allow an answer that has the idea of the tail being used for movement e.g. the tail helps it reach its destination as extra marking points allow streamlined shape for swimming (1) allow mitochondria for energy (1) allow acrosome / head to (produce enzymes that) digest into the egg or break down or penetrate into the egg (1) ignore the head helps it get to egg / digest the egg
Total			4	

Question		Answer	Marks	Guidance
2	(a)	oxygen food oxygen (2)	2	three correct scores 2 two correct scores 1 more than one substance on second or third line is incorrect allow O ₂ allow O ₂
	(b)	(cell) membrane (1)	1	
Total			3	

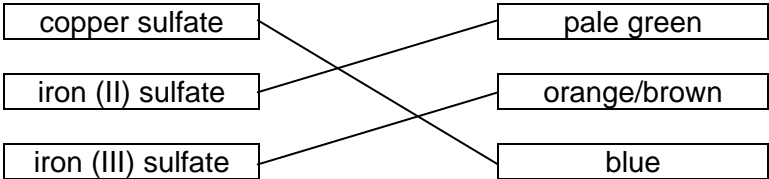
Question		Answer	Marks	Guidance
3	(a)	artery / arteries (1)	1	
	(b)	site of exchange (with the tissues or air) / to allow heat loss (1)	1	allow diffusion (of substances into or out of blood e.g. oxygen / nutrients) allow gas exchange ignore to get oxygen to the muscles not diffusion of blood allow to allow the formation of tissue fluid ignore squeezes tissues fluid out
	(c)	12 (%)	1	
	(d)	pulmonary (artery)	1	
Total			4	

Question			Answer	Marks	Guidance
4	(a)	(i)	(positive) phototropism (1)	1	allow phototropic (response)
		(ii)	auxin (1)	1	allow IAA ignore ethane / ethylene
		(iii)	tick in second box (when the plant produces flower) (1)	1	more than one tick = 0 marks
	(b)		cell wall (1) vacuole (1)	2	order unimportant
	(c)		can kill the weeds (using weed killer / herbicide) on the fields without killing or damaging the soya plants (1)	1	allow idea of soya plant not being harmed / killed / affected by the weed killer
Total				6	

Question		Answer	Marks	Guidance
5	(a)	nucleus (1)	1	allow mitochondria / chromosomes / genes
	(b)	enzymes (1)	1	
	(c)	a persons DNA is unique / everybody has different DNA / AW (1)	1	allow they don't have an identical twin allow everyone has a unique genetic code ignore everyone is different unless qualified
Total			3	

Question		Answer	Marks	Guidance
6	(a)	lithium / sodium / rubidium / caesium / francium (1)	1	allow Li / Na / Rb / Cs / Fr
	(b)	alkali metals (1)	1	both words needed not alkaline metals
	(c)	any two from (stops) reaction or contact with air / potassium reacts with oxygen or air (1) (stops) reaction or contact with water / potassium reacts with water (vapour) or moisture (1) very reactive (1)	2	allow reacts quickly with oxygen (2) allow reacts violently with water (2) allow reacts with moist air (2) ignore does not react with oil
	(d)	hydrogen (1) potassium hydroxide (1)	2	allow H ₂ not H ² / H2 / H allow KOH order of products unimportant
Total			6	

Question		Answer	Marks	Guidance
7	(a)	zinc (1)	1	allow Zn (symbols must be correct) ignore 420
	(b)	copper (1)	1	allow Cu (symbols must be correct)
	(c)	idea that the densities of silver and copper are high(er) / density is too high (so wires would sag) (1) idea that silver and copper are too expensive (1)	2	allow they are more dense or denser than aluminium allow wires are heavy allow references to just one metal e.g. silver has a high density ignore they are heavier allow they are (more) expensive (than aluminium) allow they would cost more allow references to just one metal e.g. silver is expensive allow 'because of the density and cost' (1) if no other marks awarded allow reverse argument for aluminium e.g. aluminium is a lot lighter and cheaper (2) ignore any comment about corrosion not reference to melting point
Total			4	

Question		Answer	Marks	Guidance
8	(a)	B (1)	1	if answer line is blank allow correct answer circled, underlined or ticked
	(b)	iron(III) sulfate - orange/brown copper sulfate - blue iron(II) sulfate - pale green 	2	three correct scores 2 one or two correct scores 1
Total			3	

Question		Answer	Marks	Guidance
9	(a)	glowing splint (1) relights (1)	2	
	(b)	cathode (1)	1	
	(c)	hydrogen / H ₂ (1)	1	allow H
	(d)	H ⁺ (1)	1	if answer line is blank allow correct answer circled, underlined or ticked
Total			5	

Question		Answer	Marks	Guidance
10	(a)	bromine (1)	1	allow Br ₂ / Br
	(b)	magnesium, carbon and oxygen (1)	1	all required in any order not Mg, C and O
Total			2	

Question		Answer	Marks	Guidance
11	(a)	increased engine size gives more CO ₂ / AW (1)	1	allow reverse argument allow more emissions / more pollution for idea of more CO ₂ ignore bigger car
	(b)	(i) 225 (1)	1	allow answer in the range 220-230
		(ii) 57 (1)	1	allow answer in the range 50 – 65 allow answer written on graph if answer line is blank allow any sensible extrapolation and if answer outside range, credit correct value taken from the graph
Total			3	

Question		Answer	Marks	Guidance
12	(a)	loads the most / 140 bricks / AW (1)	1	ignore any reference to time
	(b)	idea that he is loading the bricks fastest / he loads the most bricks in 10s (1)	1	allow higher level answers in terms of bricks loaded per second e.g. he loads 0.7 bricks per second but not just he loads 7 bricks in 10s / he loads a lot of bricks in 10s
Total			2	

Question		Answer	Marks	Guidance
13	(a)	air bags / seat belts (1)	1	allow bumper allow padded structures e.g. padded steering wheel not safety cage
	(b)	heat (1)	1	allow thermal ignore sound ignore potential
	(c)	any one from does not need to use hand to turn window handle / AW (1) easier to open or close window (1) quicker to open or close window (1)	1	allow only needs to push a button allow less distraction / better concentration allow hand off steering wheel for less time allow prevents children from opening them / can be controlled or locked by the driver ignore mention of crash
	(d)	they become stretched / damaged / may not work next time / broken / torn (1)	1	allow possible damage to anchor points / become loose / cannot stretch again not changes strength/ gets weaker
Total			4	

Question		Answer	Marks	Guidance
14	(a)	<p>distance measuring tape / trundle wheel (1)</p> <p>time stopwatch / stop clock (1)</p>	2	<p>allow metre wheel</p> <p>ignore pedometer / metre rule / metre stick</p> <p>not merely clock / watch / timer / mobile phone or other device containing a stopwatch</p> <p>but allow use stopwatch function on a mobile phone</p>
	(b)	(i)	1	<p>allow going up / accelerating / gets faster</p> <p>ignore changing / more</p>
		(ii)	1	<p>allow not changing / running at his fastest speed / stays the same / steady speed</p> <p>ignore he has kept his terminal speed</p> <p>not his speed has stopped / he is not moving</p>
		(iii)	2	
		<p>2 (2)</p> <p>but if answer is incorrect</p> <p>$8 \div 4$ (1)</p>		
		Total	6	

Question		Answer	Marks	Guidance	
15	(a)	<p>any two from</p> <p>car has less drag / less air resistance AW (1)</p> <p>car more streamlined / AW (1)</p> <p>drag acts against movement / AW (1)</p>	2	<p>assume answer refers to car unless van clearly stated</p> <p>must be idea of comparison for streamlined / aerodynamic and also for air resistance / drag</p> <p>allow reverse argument e.g. van has more drag</p> <p>allow reverse argument e.g. van has is less streamlined</p> <p>allow more aerodynamic / wedge-shaped</p> <p>not better shape</p> <p>not just “ more resistance”</p>	
	(b)	(i)	23 (1)	1	
		(ii)	between seeing a need to brake and applying the brake / whilst reacting / AW (1)	1	allow before the brakes are pressed
		(iii)	whilst braking / from when the brakes are applied until the car stops (1)	1	ignore whilst slowing down / before the car comes to a stop
			Total	5	

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