



GCSE

## Additional Science B

General Certificate of Secondary Education B623/01

Unit 1: Modules B3, C3, P3

### Mark Scheme for June 2010

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Question		Expected Answers	
		Marks	Additional Guidance
1	(a) (i)	(towards) light (1)	1 <b>allow</b> get light / for photosynthesis / make food / phototropism / towards the sun / towards sunlight / because of the sun / attracted to the light
	(ii)	(towards) gravity (1)	1 <b>allow</b> away from light / where there is no light <b>allow</b> get water / get minerals / geotropism / get nutrients <b>allow</b> anchorage / to keep plant stable <b>ignore</b> support / to hold plants upright <b>not</b> to get food / to get energy
	(b)	remove piece of plant / remove shoot / get a root / get a stem (1)  <b>and any two from:</b> put into suitable medium / soil (1)  (dip into) rooting powder / rooting hormone (1)  warm conditions / leave in light / keep moist / water (1)	3 <b>allow</b> get a leaf <b>ignore</b> take a plant cutting / take a flower bud <b>not</b> take a stem with roots  <b>ignore</b> put into ground / put into fertiliser
	(c)	genetically identical / clone / (produced by) asexual reproduction / has one parent (1)	1 award mark for answers that suggest that the plants all come from the same plant but not from the same type of plant  <b>allow</b> all come from a single plant / all come from the same plant
	(d)	change to gene / change to DNA (1)	1 <b>allow</b> change in chromosomes / change in genetic material / change in base sequence (of DNA) / extra genetic material produced / loss of genetic material <b>not</b> genetic modification
	<b>Total</b>		7

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Question		Expected Answers	Marks	Additional Guidance
2	(a)	fast growth rate (1)  resistance to many diseases (1)	2	if more than two answers given mark incorrect ones first – <b>one</b> incorrect award max of 1 mark <b>two</b> incorrect award 0 marks
	(b)	<b>any two from:</b>  small(er) (1)  streamlined / thin <b>and</b> long / not round (1)  tail / can swim (1)  pointed head (1)	2	Assume answer refers to sperm unless egg is specified  <b>allow</b> higher level answers such as may contain Y chromosome / contains male genes (1) more mitochondria / lots of mitochondria (1) no food stored / less food stored (1) contains acrosome / contains enzymes to break through egg cell membrane (1)  <b>ignore</b> simply 'move' <b>ignore</b> head can penetrate the egg cell membrane
	(c) (i)	4 (1)	1	
	(ii)	3 (1)	1	
	(iii)	2 (1)	1	
		<b>Total</b>	7	

Question	Expected Answers		Marks	Additional Guidance
3 (a) (i)	(rate) increases to pH 7 / increases to neutral / increases to optimum / increases to 41 (1)  (rate) decreases above pH7 / decreases from neutral / decreases from optimum / decreases from 41(1)		2	assume description refer to increasing pH unless specified otherwise  <b>allow</b> (rate) increases then decreases / reaction faster and then slower / lower (rate) at high and low pH (2) <b>allow</b> (rate) peaks at pH7 / (rate) is maximum at neutral / (rate) is highest at 41 (1)
	(ii) 7.0 (1)		1	<b>allow</b> any answer in range 6.8 and 7.2 (1)
(b) (i)	diffusion (1)  higher concentration in intestine / lower concentration in blood (1)		2	explanation must be <b>linked</b> to correct process  <b>allow</b> diffusion anywhere in answer  this marking point must have a <b>comparison</b> <b>allow</b> high concentration to low concentration <b>allow</b> high concentration in intestine, low concentration in blood <b>but</b> high concentration in intestine on its own should not be awarded a mark  <b>allow</b> higher level answers in terms of active transport / active uptake (1) with <b>correct link</b> to carrier (molecule) / needs energy / needs ATP (1)
	(ii) plasma (1)		1	
	<b>Total</b>		<b>6</b>	

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Question	Expected Answers	Marks	Additional Guidance
4 (a)	lighted splint / burns (1) pops / (small) explosion (1)	2	allow one mark for pop tests / splint gives a squeaky pop
(b)	cathode (1)	1	
(c)	oxygen (1)	1	allow any answer indicating candidate knows the gas is oxygen O <sub>2</sub> / O / O <sup>2</sup>
(d)	H <sup>+</sup> (1)	1	if answer line is blank allow correct answer circled, underlined or ticked
	<b>Total</b>	<b>5</b>	

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Question		Expected Answers	Marks	Additional Guidance
5	(a)	fluorine / iodine / astatine (1)	1	<b>allow</b> $F_2$ / $I_2$ / $At_2$ / F / I / At
	(b)	sodium bromide (1)  potassium chloride (1)	2	<b>allow</b> NaBr <b>not</b> sodium bromine  <b>allow</b> KCl <b>not</b> potassium chlorine
	(c)	sodium + chlorine $\rightarrow$ sodium chloride (1)	1	<b>allow</b> = for $\rightarrow$ but do <b>not allow</b> and for +  <b>allow</b> correct formulae but equation does not need to balance e.g. • $Na + Cl_2 \rightarrow NaCl$ • $Na + Cl_2 \rightarrow 2NaCl$  <b>allow</b> mix of correct formulae and words  <b>not</b> $Na + Cl \rightarrow NaCl$
	(d)	making pesticides (1)	1	if answer line is blank allow correct answer circled, underlined or ticked
		<b>Total</b>	<b>5</b>	

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Question	Expected Answers	Marks	Additional Guidance
6 (a)	B (1)	1	if answer line is blank allow correct answer circled, underlined or ticked
(b)	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px;">iron(III) sulfate</div> <div style="border: 1px solid black; padding: 2px;">orange/brown</div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px;">copper sulfate</div> <div style="border: 1px solid black; padding: 2px;">pale green</div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="border: 1px solid black; padding: 2px;">iron (II) sulfate</div> <div style="border: 1px solid black; padding: 2px;">blue</div> </div>	2	<b>all three</b> correct award 2 marks <b>one or two</b> correct award 1 mark
(c)	<b>any two from</b> high melting point / solid at room temperature (1) high boiling point (1)  (good) conductor of heat (1) (good) conductor of electricity (1) hard (1) high density (1) high tensile strength / strong (1) malleable / flexible / can bend easily (1) ductile / can be drawn into wires (1)  sonorous (1)	2	If <b>one</b> property is contradicted within answer max 1 mark e.g. some conduct electricity and others do not If <b>two</b> properties are contradicted within answer then award 0 marks  <b>ignore</b> heat resistance  <b>allow</b> good conductor (1) if no reference to heat or electricity  <b>ignore</b> lustrous it is given in the question  <b>allow</b> strong metallic bond <b>ignore</b> durable / can make alloys / magnetic  <b>allow</b> chemical properties: react with acids (1) lose electrons (1) (forms) positive <u>ions</u> (1) reducing agents (1) form basic oxides (1) form ionic compounds with non-metals / form ionic compounds with named non-metal (1)
	<b>Total</b>	5	

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Question	Expected Answers		Marks	Additional Guidance
7 (a) (i)	3 / three (1)		1	allow copper, carbon and oxygen
	(ii) 5 / five (1)		1	
	(iii) 29 (1)		1	allow the proton number / number of protons in atom
(b)	soluble (in water) (1) high (melting point) / AW (1)		2	allow dissolves / dissolved / makes a (colourless) solution / good / high not reacts with water  allow large / big / quoted number of at least 600 °C
	<b>Total</b>		<b>5</b>	

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Question		Expected Answers	Marks	Additional Guidance
8	(a)	<b>distance</b> measuring tape / trundle wheel (1)	2	<b>allow</b> metre wheel <b>ignore</b> pedometer / metre rule / metre stick
		<b>time</b> stopwatch / stopclock (1)		<b>not</b> merely clock / watch / timer / mobile phone or other device containing a stopwatch <b>but allow</b> use stopwatch function on a mobile phone
	(b) (i)	increases / AW (1)	1	<b>allow</b> going up / accelerating <b>ignore</b> changing / more
	(ii)	constant / steady / uniform / stays at 9 m/s (1)	1	<b>allow</b> not changing / running at his fastest speed
	(iii)	3 (2) <b>but if answer is incorrect</b> $9 \div 3$ (1)	2	
		<b>Total</b>	6	

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Question		Expected Answers	Marks	Additional Guidance
9	(a)	(i) A (1)	1	mark the answer line but if answer line is blank credit the correct answer ticked circled or underlined in the list more than one answer scores zero
		(ii) B (1)	1	mark the answer line but if answer line is blank credit the correct answer ticked circled or underlined in list more than one answer scores 0
	(b)	(i) 60 000 (2) <b>but if answer is incorrect</b> 4 000 x 15 (1)	2	
		(ii) watt (1)	1	mark the answer line but if answer line is blank credit the correct answer ticked circled or underlined more than one answer scores zero

Question	Expected Answers		Marks	Additional Guidance
9 (c)		<p><b>braking distance: max one from</b>            idea of one specified road condition / weather condition            eg wet / loose gravel / ice / leaves / snow / mud (on road) (1)</p> <p><b>or</b></p> <p>idea of one specified car condition            eg bald tyres / poor tyres / worn brakes / poor brakes (1)</p> <p><b>or</b></p> <p>greater mass / greater load / more people in car (1)</p>	2	<p>read entire answer to ensure there are no contradictions eg. a list of braking distance factors including a thinking distance factor</p> <p>answer must be <b>clearly linked</b> to braking distance</p> <p><b>allow</b> slippery (road surface)</p> <p><b>ignore</b> unqualified references to weather / road conditions            eg. bad weather is not sufficient but if its raining or snowing should be awarded a mark</p> <p><b>ignore</b> its foggy / its windy</p> <p><b>ignore</b> unqualified references to tyres / brakes            e.g. condition of brakes is not sufficient but tyres have poor grip should be awarded a mark</p>
		<b>thinking distance: max one from</b> driver tired / (under influence of) alcohol / (under influence of) drugs / distractions from inside or outside car (1)		<p>answer must be <b>clearly linked</b> to thinking distance</p> <p><b>allow</b> named distraction eg passengers / phone / radio / kids in back seat / smoking / eating / drinking / pedestrians / signs at roadside</p> <p><b>allow</b> increased age / older age</p>
(d) (i)		petrol / diesel (1)	1	<p><b>allow</b> LPG / hydrogen</p> <p><b>ignore</b> oil</p>
	(ii)	solar power / idea of battery in the car / battery that gets charged / battery stores energy or charge (1)	1	<p><b>allow</b> charged from mains / from power station / fuel cell</p> <p><b>ignore</b> plugged into mains</p>
	<b>Total</b>		<b>9</b>	

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Question		Expected Answers	Marks	Additional Guidance
10		<b>any two from:</b> crumple zones / bumpers (1) seat-belts (1) air bags (1)	2	<b>ignore</b> brakes (pads or shoes) <b>allow</b> side impact bars <b>allow</b> safety cage / roll bars (1) <b>allow</b> reasonable energy absorbing materials in car eg padded fascia <b>allow</b> tyres
<b>Total</b>			2	

Question		Expected Answers	Marks	Additional Guidance
11	(a)	(i) A (1)	1	mark the answer line but if answer line is blank credit the correct answer ticked circled or underlined more than one answer scores zero
		(ii) C (1)	1	mark the answer line but if answer line is blank credit the correct answer ticked circled or underlined more than one answer scores zero
	(b)	air resistance / drag (1)	1	<b>allow</b> friction (with the air) <b>ignore</b> upthrust / wind resistance <b>not</b> gravity / (potential) energy
<b>Total</b>			3	

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