



General Certificate of Secondary Education

Additional Applied Science 4863

AASC/2H Science at Work

Mark Scheme

2010 examination - January series

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Higher / 2H

question	answers	extra information	marks
1(a)(i)	4 bars plotted correctly 2 marks 1, 2 or 3 bars plotted correctly 1 mark Scale correct 1 mark	$\pm \frac{1}{2}$ small square If no scale, can still get the plotting marks Scale half the grid or above No marks if given data is used as scale If scale is correct (1, 2, 3, 4, 5) but origin is not labelled, allow mark. If scale starts any other way, the origin must be labelled correctly to gain the mark for the scale. For a line graph max 1 mark for scale	3
1(a)(ii)	<u>Increase</u> in the number / chickens (kept organically)	<u>Not</u> 'it' increases Ignore specific values, ie must identify the whole range.	1
1(a)(iii)	<u>More</u> people want to eat organic chickens / eggs / more in demand / people concerned about the welfare / health of chickens	Ignore it is healthier / tastier	1

Higher / 2H

question	answers	extra information	marks
<p>1(b)(i)</p>	<p>Any two from:</p> <ul style="list-style-type: none"> • (Artificial) chemicals not used e.g. herbicides, pesticides, chemical fertilisers • No growth hormones / antibiotics / supplements • Fed organic food • Allowed to roam free/given more space /allowed access to outdoors 	<p>Allow biological pest control</p> <p>Allow allowed to grow naturally</p> <p>Allow natural food</p> <p>Ignore daylight</p>	<p>2</p>
<p>1(b)(ii)</p>	<p>Any two from:</p> <ul style="list-style-type: none"> • More expensive (to rear) • Take longer to <u>gain</u> weight / <u>grow</u> • More labour • More space needed / more land 	<p>Not higher risk of getting disease</p> <p>Ignore reference to profit</p> <p>Ignore lower yield / don't produce as much meat</p> <p>Allow more prone to predators</p>	<p>2</p>
			<p>9</p>

Higher / 2H

question	answers	extra information	marks
2(a)(i)	Polymer / leather / suede / polyurethane / rubber / silicone	Not Plastic / silicon / polythene / material / cloth	1
2(a)(ii)	(Better) grip / (more) friction		1
2(b)(i)	Any two from: <ul style="list-style-type: none"> • Light / less dense • Strong / difficult to break • Doesn't corrode 	Do not accept any points not taken from the table (eg flexible) Not density Not just strength Not hard or melting point	2
2(b)(ii)	Hard Will not corrode	Do not accept any points not taken from the table (eg durable) Allow hardness, but not hard to break (which refers to strength) Allow does not rust Not density / light	1 1
2(c)	Composite		1
2(d)	Any two from: <ul style="list-style-type: none"> • lightweight • doesn't absorb so much water / waterproof / doesn't get heavy when wet • more flexible / soft / stretchy • leather changes shape / synthetic doesn't shrink 	ignore references to cost / comfort / manufacturing / looks / cleaning / strength / durability / environment / breathability / easier to put on / better fit / wicking	2
Total			9

Higher / 2H

question	answers	extra information	marks
3(a)(i)	Flame test		1
3(a)(ii)	(Brick) red flame		1
3(a)(iii)	Add dilute HCl / hydrochloric acid / acid		1
3(a)(iv)	Fizzing / gas given off / test the gas given off with limewater / limewater goes cloudy	Accept CO ₂ / carbon dioxide given off Not solution goes cloudy (too vague)	1
3(b)	CaCO ₃	Number must be subscript, must be 3	1
3(c)(i)	Soluble / dissolves(in water) or it is not chalk / is not calcium carbonate	Not no carbonate / calcium ions	1
3(c)(ii)	(Universal) indicator Check colour change / use colour scale / pH chart or pH meter Read scale / pH	Independent marks Ignore pH paper / litmus paper If specific colours are mentioned they must be correct to get the mark	1 1 1 1
3(c)(iii)	Acidic	Ignore qualification	1

Higher / 2H

question	answers	extra information	Marks
3(d)	<p>Either:</p> <ul style="list-style-type: none"> • Dust / powder • Lift with sticky tape / sellotape • Mount on card / slide <p>Or:</p> <ul style="list-style-type: none"> • use UV light / illumination / quasar light / superglue fumes • photograph • scan photo into computer / database 	<p>Not paper</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p> <p>1</p>
Total			12

Higher / 2H

question	answers	extra information	Marks
4(a)(i)	Any two from: <ul style="list-style-type: none"> • Pulse / heart rate increases / blood pumped faster • More blood is pumped with each beat • Breathing rate increases • Depth of breathing increases / breathing gets heavier / tidal volume increases 	Ignore harder	2
4(a)(ii)	Glucose broken down to lactic acid / glucose is only partly broken down	Accept 'it' only if clearly referring to glucose	1
4(a)(iii)	<u>Anaerobic</u> respiration		1

Higher / 2H

question	answers	extra information	marks
4(b)	<p>(If glucose rises / is too high)</p> <p>Any three from:</p> <ul style="list-style-type: none"> • Insulin is produced • By the pancreas • Converts glucose to glycogen • Insulin lowers blood glucose • Stored in liver or muscles <p>(When glucose falls / is too low)</p> <p>Any one from:</p> <ul style="list-style-type: none"> • Glucagon produced • Converts glycogen to glucose 	<p>Max 2 marks if in wrong context</p> <p>Allow sugar</p> <p>No marks if in wrong context</p>	<p>3</p> <p>1</p>
4(c)	<p>Any two from:</p> <ul style="list-style-type: none"> • (Carbohydrates) break down slowly • <u>Increase</u> glycogen / <u>increase</u> energy stores • In the muscles • Releases energy slowly 		2
Total			10

Higher / 2H

question	answers	extra information	marks
5(a)	<p>Any three from:</p> <ul style="list-style-type: none"> • List of nutrients / quantity of nutrients • Energy value of nutrients / calorie content • Shelf life / sell by date • Weight of food • Name and address of manufacturer • Place of origin • Process used in manufacture • Instructions for use / how to cook • Storage conditions 	<p>(fat, sugar, protein, salt)</p> <p>Allow information on allergens / allergy advice</p> <p>Ignore reference to GDA, RDA, price, suitability for vegetarians, additives, GM free</p> <p>Eg pasteurisation</p>	3
5(b)(i)	<p>People should know the facts / have a right to know / so can decide whether to buy it / so company won't be sued</p> <p>Maybe harmful to health over a long period of time / can cause allergic reactions / irritate skin, eyes, mucous membrane / hypersensitivity / hyperactivity</p>	<p>owtte</p> <p>Ignore warn / warning</p>	1 1

Higher / 2H

question	answers	extra information	marks
5(b)(ii)	Any two from: <ul style="list-style-type: none"> • Not proven the additive can be harmful / may not be harmful • Might make drink look less healthy / give company a bad name / damage reputaion • Would reduce sales. • Company might get blamed for someone becoming ill when it is not their fault 	owtte	2
5(c)(i)	Two from: <ul style="list-style-type: none"> • Helps body to make haemoglobin / <u>red</u> blood cells • Needed to transport oxygen round body • To prevent anaemia 		2
5(c)(ii)	Vitamin C / C	Don't need the word vitamin	1
Total		10	

Higher / 2H

question	answers	extra information	marks
6(a)	Take (several) samples from different areas of the crime scene		1
	Every area must be sampled		1
6(b)(i)	Copper / Cu / Cu ²⁺ / Cu ⁺⁺	The u must be clearly a lower case letter	1
6(b)(ii)	Copper hydroxide / Cu(OH) ₂		1
6(c)	<p>Any two from:</p> <ul style="list-style-type: none"> • High melting point • High boiling point • Positive ions and negative ions / oppositely charged ions / metal and non-metal (ions) • <u>Giant</u> lattice • Crystalline • Held together by <u>strong</u> forces (of attraction) / bonds / difficult to break apart. 	<p>Allow conducts when molten / when in solution</p> <p>Allow ions closely packed</p>	2
Total			6

Higher / 2H

question	answers	extra information	marks
7(a)	26.18 51	<p>Accept 26 or 26.2</p> <p>$\frac{116}{443} \times 100 =$ for 1 mark</p> <p>or $100 - (327/443 \times 100) =$ for 1 mark</p>	2
7(b)	<p>Any two from:</p> <ul style="list-style-type: none"> • Not fair to select a certain group of people / danger of stigma / link with criminals • Only fair if everyone is tested • Against the ‘big brother’ idea / intrusion of privacy • Results could be used for other purposes • Children can’t speak for themselves 		2
Total			4
Overall Mark			60