



General Certificate of Secondary Education

Additional Applied Science 4863

AASC/2H Science at Work

Mark Scheme

2008 examination – January series

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question	answers	extra information	marks
1(c)	any one from: <ul style="list-style-type: none">• thin / flexible bottom plate• less / no support / protection to the foot or <ul style="list-style-type: none">• laces at the side• less protection to the foot or <ul style="list-style-type: none">• sharper studs• more pressure on foot when stood on or <ul style="list-style-type: none">• lower ankle• less support / protection or <ul style="list-style-type: none">• toe more pointed• digs into ground / more pressure on foot	feature must be qualified to obtain both marks	2

question	answers	extra information	marks
1(d)	<p>material – metal, polymer or composite</p> <p>reason:</p> <p>metal, two from:</p> <ul style="list-style-type: none"> • strong / doesn't break • durable / tough / long lasting • hard <p>polymer, two from:</p> <ul style="list-style-type: none"> • light • strong • durable <p>composite, two from a combination of the above</p>	<p>no marks for material</p> <p>no marks if haven't stated material or given wrong material</p> <p>two materials each with one reason = 2 marks</p> <p>ignore references to waterproofing</p> <p>ignore grip</p> <p>a mention of a composite combining the properties of metal and polymer gains two marks</p>	2
Total			9

question	answers	extra information	marks
2(a)	loop		1
2(b)(i)	yes – no mark fingerprint <u>matches</u> C / one of the prints at the crime scene		1
2(b)(ii)	15 (mm)	± 1 mm allow 1.5 cm, but must give correct unit	1
2(b)(iii)	3(mm) or 1/5 of candidate's answer to (ii)		1
2(c)	any three from: <ul style="list-style-type: none"> • dust / powder • lift with Sellotape / sticky tape / photograph (the print) • mount on card / slide • (store) on computer / database 	allow glue / UV light must be a consistent technique ignore contamination issues	3
2(d)	only proves suspect was at the scene then one from: <ul style="list-style-type: none"> • (may have been at the scene) at a different time • (was present) but did not commit the crime 		1 1
Total			9

question	answers	extra information	marks
3(e)(i)	benzoic acid / sodium hydrogen sulfite / sulfur dioxide / sorbic acid	accept salt or sugar / glucose / syrup not vinegar allow any E200s	1
3(e)(ii)	tartrazine / caramel / sunset yellow	accept answer that looks or sounds correct not sunset orange allow any E100s	1
3(f)	any two from: <ul style="list-style-type: none"> • prevents colon cancer • clears digestive system / clears waste / keeps food moving • prevents constipation • bulks out food / increase volume • to prevent overeating / snacking on sugar 	not aids digestion / clears food	2
Total		12	

question	answers	extra information	marks
4(a)	any four from: <ul style="list-style-type: none"> • <u>increased</u> heart rate / pulse / blood pumps faster • <u>increased</u> breathing rate • (increased) sweating / loss of water • increased blood flow to the skin / muscles / skin reddening • increase in temperature / hairs lie flat • deeper breathing / tidal volume increase • build-up of lactic acid (in muscle) • more glucose released 	ignore out of breath ignore dehydrated not core temperature – allow body temperature not shallower breathing / tidal volume decreases	4
4(b)	any two from: <ul style="list-style-type: none"> • to increase glycogen stores / complex carbohydrates stored as glycogen / energy • glycogen turned to glucose / to supply glucose • glucose needed for energy • slow / steady release of energy / long lasting 		2

question	answers	extra information	marks
4(c)(i)	$C_6H_{12}O_6$		1
4(c)(ii)	covalent	not covalent	1
4(c)(iii)	<ul style="list-style-type: none">• weak forces• between molecules / particles		1 1
Total			10

question	answers	extra information	marks
5(a)(i)	any two from: <ul style="list-style-type: none"> • blood • semen • saliva • hair • skin 	ignore fingerprints ignore sweat ignore cells ignore clothing	2
5(a)(ii)	nucleus / chromosome / genes	accept mitochondria not nucleolus	1
5(b)(i)	electrophoresis		1
5(b)(ii)	any four from: <ul style="list-style-type: none"> • electric current passed through the gel / plate • DNA is negatively charged • attracted to / drawn to the positive terminal / anode • DNA fragments have different masses / sizes • smaller masses / fragments moved through the gel further / quicker / easier 	ignore density accept converse	4
5(c)	<ul style="list-style-type: none"> • suspect 2 • bands match / same pattern / matches evidence DNA 		1 1
Total			10

question	answers	extra information	marks
6(a)(i)	bacterium		1
6(a)(ii)	leaking waste pipe / broken pipe/ faulty pipe		1
6(b)	any four from: <ul style="list-style-type: none">• collect samples from chocolate• collect samples from people• make streak plates• incubate / leave several days / cultivate / allow to multiply• compare / match (types of bacteria)		4
6(c)	only processed at 30 °C / temperature not high enough		1

question	answers	extra information	marks
6(d)	reference to any three of: <ul style="list-style-type: none"> • no immediate instruction • no confirmation (for 6 months) of Salmonella presence / no evidence • (company) didn't realise the danger • financial cost (of recall / compensation / loss of sales) • loss of reputation • mention of health risk in an appropriate context (eg the health risk created was unprofessional) • didn't want to create a scare / panic • HCCP (in context) 		3
Total			10
Overall mark = 60			