



General Certificate of Secondary Education

Additional Applied Science 4863

AASC/2F Science at Work

Mark Scheme

2009 examination – January series

STANDARDISATION

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question	answers	extra information	marks
1(a)(i) E	live (yoghurt) / <i>Lactobacillus acidophilus</i> / <i>bioculture</i>	<i>Ignore extra information</i>	1
1(a)(ii) G	10%		1
1(a)(iii) G	(Modified) maize starch / thickener	<i>Allow sugar</i>	1
1(a)(iv) E	490kJ / 116 kcal	1 mark for value, one mark for unit <i>allow 1 mark for correct value or correct unit</i>	2
1(a)(v) G	fat		1
1(b)(i) E	to kill (any harmful) bacteria	<i>Allow get rid of / sterilize</i> <i>Ignore to stop bacteria growing</i>	1
1(b)(ii) E	to encourage the bacteria to grow / multiply	<i>Ignore spread / develop / fermentation</i>	1
1(b)(iii) A	energy		1

question	answers	extra information	marks
1(b)(iv) A	pH 5		1
1(b)(v) E	<ul style="list-style-type: none"> use (universal) indicator paper / solution; 	<i>Allow pH paper</i>	2
	<ul style="list-style-type: none"> compare colour with chart; <p>or</p> <ul style="list-style-type: none"> use pH meter; read scale; 	<i>Allow recognition of colour usage</i>	2
Total			12

question	answers	extra information	marks
2(a) E	A – no mark two from: <ul style="list-style-type: none"> • red / flushed (face)/ darker (face) • sweating / hot • panting/ out of breath 	<i>Ignore references to water bottle</i> <i>Allow change of skin colour</i>	2
2(b)(i) G	oxygen		1
2(b)(ii) A	lungs		1
2(b)(iii) A	heart		1
2(c) A	glucose		1
2(d)(i) G	sprinting		1
2(d)(ii) E	$22 - 14 = 8$ (breaths per minute)		1

question	answers	extra information	marks
2(e) E	count number of <u>breaths</u>		1
	in set amount of time		1
Total			10

question	answers	extra information	marks
3(a) G	<ul style="list-style-type: none"> • Make a plaster cast: to record impressions • Sealed evidence bag: to avoid contamination of evidence • Use tweezers: to collect fibre samples • Dust with fine powder: to reveal fingerprints • Swab with sterile cotton bud: to collect blood samples 	All 5 correct: 4 marks 4 correct: 3 marks 3 correct: 2 marks 2 correct: 1 mark 1 correct: 0 marks	4
3(b)(i) A	E		1
3(b)(ii) E	no (no marks) could have been used / fired by someone else / could have been fired at a different time	<i>Allow could have been stolen/ planted</i>	1
3(c)(i) G	<ul style="list-style-type: none"> • nuclei • white • plasma 		1 1 1
3(c)(ii) E	no (no mark) DNA is unique (to the individual)	<i>Allow yes if <u>identical</u> twins</i>	1
Total			10

question	answers	extra information	marks
4(a)(i) E	dehydrated	<i>Not 'severely dehydrated'</i>	1
4(a)(ii) E	through sweat / breathing	<i>Ignore evaporation</i> <i>Accept vomiting/ diarrhoea</i>	1
4(a)(iii) A	<ul style="list-style-type: none"> • electrolytes • glucose • water 	all three correct = 2 marks two correct = 1 mark	2
4(b)(i) A	Q		1
4(b)(ii) E	more carbohydrates / least amount of fat	<i>Mark independently of 4(b)(i)</i>	1
4(c)(i) E	natural: cotton/ wool/ silk/ linen synthetic: polyester / nylon / polypropylene / lycra / acrylic / viscose	<i>allow spandex</i> <i>not polythene / polystyrene / PVC / plastic</i>	1 1

question	answers	extra information	marks
<p>4(c)(ii) E</p>	<p>any two from:</p> <ul style="list-style-type: none"> • dries quickly/ <i>wicks / lets sweat out</i> • light(weight) / low density • flexible • <i>can be dyed in bright colours / colourfast</i> • stain resistant / <i>easy to clean</i> • durable/ <i>hard wearing/ long lasting</i> 	<p><i>Ignore cost / shrinking / strength / thin / non iron</i></p> <p><i>Allow does not absorb sweat</i></p> <p><i>Allow comfortable</i></p> <p><i>Do not allow keeps you cool</i></p>	<p>2</p>
<p>Total</p>		<p>10</p>	

question	answers	extra information	marks
5(a)(i) E	person 1 = 7.1(g) person 3 = 8.4(g)		1 1
5(a)(ii) E	person 1 <i>or</i> person 3	Allow ecf from (i)	1
5(a)(iii) E	two from: <ul style="list-style-type: none"> • less processed foods / less takeaway foods/ <i>less fast food/ junk food</i> • low salt varieties/ <i>less salty food</i> • do not add salt to food 	<i>Do not allow check labels for salt content</i>	2
5(a)(iv) E	high blood pressure / heart attack / <i>stroke</i>	<i>Allow kidney disease / heart disease / failure</i> <i>Ignore heart problems or high cholesterol</i>	1

<p>5(b)(i) E</p>	<p>two from:</p> <ul style="list-style-type: none"> • giant lattice • held together by strong <i>bonds/</i> forces of attraction <i>Allow opposite charges attract</i> • between +ve and -ve <i>(oppositely charged)</i> <u>ions</u> • <i>made of a metal and a non-metal</i> 	<p>2</p>
<p>5(b)(ii) A</p>	<p>801 °C</p>	<p>1</p>
<p>Total</p>		<p>9</p>

question	answers	extra information	marks
6(a)(i) E	formation of a solid <i>(from appropriate substances)</i>	accept precipitate	1
6(a)(ii) E	copper / Cu/ Cu^{2+} / copper ion	<i>Ignore size of letters</i>	1
6(b)(i) E	<i>Bubbling/ fizzing / gas given off/ carbon dioxide given off</i> calcium	<i>Do not allow other named gases</i>	1 1
6(b)(ii) E	calcium carbonate	<i>Allow ecf</i>	1

question	answers	extra information	marks
<p>6(b)(iii) E</p>	<p>three from:</p> <ul style="list-style-type: none"> • wear eye protection • clean wire loop/ <i>dip</i> in HCl <i>and put in flame</i> • repeat until the wire doesn't produce any colour in flame • dip loop in sample • place in hot / <i>blue</i> / <i>roaring</i> flame • record / <i>identify</i> colour of flame <p>If candidate uses splint instead of loop:</p> <ul style="list-style-type: none"> • <i>wear eye protection</i> • dip in sample • place in hot / <i>blue</i> / <i>roaring</i> flame • record/ <i>identify</i> colour of flame 	<p><i>Ignore sterilise</i></p> <p><i>Allow observe /see what colour the flame is</i></p> <p><i>Allow observe /see what colour the flame is</i></p>	<p>3</p> <p>1</p> <p>1</p> <p>1</p>

<p>6(b)(iv) E</p>	<p>one from:</p> <ul style="list-style-type: none"> • use clean equipment • no contaminants in reagents • use distilled water 	<p><i>Ignore repeat</i></p> <p><i>Ignore sterilise</i></p> <p>1</p>
<p>Total</p>	<p>9</p>	