



General Certificate of Secondary Education

Additional Applied Science 4863

AASC/2H Science at Work

Mark Scheme

2008 examination - June series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

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**ADDITIONAL APPLIED SCIENCE
GCSE**

AASC/2H

MARK SCHEME

JUNE 2008

question	answers	extra information	marks
1(a)	increasing percentage of overweight children	allow number / indication of increase in number of children	1
1(b)	<p>any one from:</p> <ul style="list-style-type: none"> • quicker / faster / easier • no parent at home to prepare a meal • not everyone at home at the same time • less interest in cooking / can't cook • more money available • more take-away shops / more variety • marketing / advertising 	<p>ignore popular ignore cost ignore taste ignore population size ignore lazy</p>	1
1(c)(i)	<p>provides 99% of the <u>energy</u> needs in one meal / high <u>energy</u> meal</p> <p>danger of over-eating / putting on weight / obesity / turn to fat</p>		<p>1</p> <p>1</p>

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question	answers	extra information	marks
<p>1(c)(ii)</p>	<p>yes – no mark</p> <ul style="list-style-type: none"> • provides too much energy / fat / carbohydrate • (stored) as fat / difficult to burn off <p>or</p> <p>no – no mark</p> <p>any two from:</p> <ul style="list-style-type: none"> • also depends on how much exercise • too many snacks • to use up / burn the energy / fat 	<p>ignore gain weight</p> <p>or</p>	<p>2</p> <p>or</p> <p>2</p>
<p>1(c)(iii)</p>	<p>any three from:</p> <ul style="list-style-type: none"> • not much fruit / vegetables • lacking in vitamins • lacking in fibre • <u>too much</u> salt • <u>too much</u> carbohydrate • <u>too much</u> fat 	<p>accept no vitamins / fibre</p> <p>ignore minerals</p> <p>ignore proteins</p> <p>ignore additives</p>	<p>3</p>

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question	answers	extra information	marks
1(d)	<ul style="list-style-type: none"> • flavouring / monosodium glutamate / MSG • improve taste / flavour <p>or</p> <ul style="list-style-type: none"> • sweetener / aspartame • make sweeter / improve taste <p>or</p> <ul style="list-style-type: none"> • colouring • make more attractive / more edible / improve appearance <p>or</p> <ul style="list-style-type: none"> • preservative / benzoic acid • keep longer / improve shelf life <p>or</p> <ul style="list-style-type: none"> • thickener / starch • improve texture / add bulk <p>or</p> <ul style="list-style-type: none"> • antioxidant / vitamin C • prevent food oxidising / changing colour / going rancid 	<p>1 mark for additive</p> <p>1 mark for valid reason</p> <p>accept sugar / glucose</p> <p>accept named example e.g. tartrazine, caramel, sunset yellow allow any E100's <i>not sunset orange</i></p> <p>accept sodium hydrogen sulfite, sulfur dioxide, ascorbic acid allow any E200's</p>	2
Total			11

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question	answers	extra information	marks
2(a)	any three from: <ul style="list-style-type: none"> • use a (sterile) swab / cotton wool <u>bud</u> / (knife) to scrape up (dried) samples • put in plastic bag / container • seal the bag / close • label 	ignore pipettes ignore paper bag	3
2(b)(i)	J = red (blood) cell K = white (blood) cell L = platelet	do not accept blood cell	1 1 1
2(b)(ii)	nucleus	allow mitochondria do not accept nuclear / nucleolus / nucules	1
2(b)(iii)	A, B, AB and O	all correct for 2 marks 2 correct for 1 mark ignore any reference to +ve/ -ve allow lowercase	2
Total			9

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question	answers	extra information	marks
3(a)(i)	body mass index		1
3(a)(ii)	$65 / (1.60)^2$ = 25.39	accept 25.390025 accept 25.3 accept 25.4	2
3(b)(i)	any two from: <ul style="list-style-type: none"> • overweight / lose some weight • reduce the amount of fats / carbohydrates / energy intake / calorie intake • <u>increase</u> your exercise / exercise <u>more</u> regularly • reduce fat and replace with slow release carbohydrate 	ignore 'healthy diet' (for 2 marks)	2
3(b)(ii)	may have a lot of muscle or muscle weighs more than fat	ignore reference to bones / age	1
3(c)	record / make a diary of what he ate		1
	record how much / amount of it he ate	ignore reference to calories	1
	time line (eg 24 hours or 2 / 3 days) / period of time / every day		1
Total			9

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questions	answers	extra information	marks
4(a)(i)	Salmonella / E. coli / Campylobacter	ignore fungus	1
4(a)(ii)	<ul style="list-style-type: none"> • wash hands • to remove bacteria / germs / prevent transfer of bacteria / germs <p>or</p> <ul style="list-style-type: none"> • tie hair back / wear hat / use gloves / don't sneeze over food / remove rings / cover cuts • to prevent bacteria / germs transferring (to food) 	<p>1 mark for precaution</p> <p>1 mark for explanation tied to precaution</p> <p>allow correct explanation if not referring to personal hygiene</p>	2
4(b)	any four from: <ul style="list-style-type: none"> • sample removed • dilution • shake tube • repeat process • in proportion 1:9 	<p>allow water / distilled water</p> <p>accept any reasonable proportion</p>	4
4(c)(i)	30		1

**ADDITIONAL APPLIED SCIENCE
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questions	answers	extra information	marks
4(c)(ii)	30×1000 30 000	ecf	1
4(c)(iii)	$30\,000 \times 10 = 300\,000$	ecf	1
Total			10

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questions	answers	extra information	marks
5(a)	<p>polypropylene</p> <ul style="list-style-type: none"> • dries quickly (after washing) • does not gain weight easily (when wet) • lightweight • will not fade / can be bright colours / colours will not run • hard wearing / strong / doesn't rip • easier to (keep) clean <p>polyester</p> <ul style="list-style-type: none"> • dries quickly (after washing) • lightweight • will not fade / can be bright colours • hard wearing / strong / doesn't rip <p>wool</p> <ul style="list-style-type: none"> • absorbs sweat • lightweight <p>cotton</p> <ul style="list-style-type: none"> • absorbs sweat 	<p>max. 4 marks</p> <p>ignore waterproof</p> <p>do not accept durable unless qualified</p> <p>max. 4 marks</p> <p>max. 2 marks</p> <p>max. 1 mark</p> <p>must look for explanation – not just properties from the table</p>	4
5(b)(i)	<u>composite</u>	ignore synthetic mixture	1

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5(b)(ii)	any two from: <ul style="list-style-type: none"> • more durable • harder • stronger • lighter • more shock absorbent 	allow does not splinter ignore easier to play with ignore malleable / flexible	2
5(c)	any three from: <ul style="list-style-type: none"> • strong / rigid / not flexible • durable • hard • light / low density • does not corrode 	ignore malleable ignore shock absorbance accept rust	3
Total			10

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questions	answers	extra information	marks
6(a)(i)	<ul style="list-style-type: none"> • bent towards the normal on entering • bent away from normal on exit 	must be drawn with ruler for mark	1 1
6(a)(ii)	correctly labelled		1
6(a)(iii)	<p>any three from:</p> <ul style="list-style-type: none"> • place glass in oil • heat oil until glass disappears • take temperature of oil • read refractive index value off chart <p>or</p> <ul style="list-style-type: none"> • measure r and i • convert to sines (sini, sinr) • $ri = \sin i / \sin r$ 		3
6(b)(i)	ethanol	ignore alcohol	1
6(b)(ii)	covalent	<p>do not accept covalent</p> <p><i>not double covalent</i> <i>allow single covalent</i></p>	1

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questions	answers	extra information	marks
6(b)(iii)	<ul style="list-style-type: none">• add (dilute) sulfuric acid• add potassium dichromate• turns from orange to green (if ethanol present)		1 1 1
Total			11