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ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Additional Applied Science 4863

AASC/2H Science at Work

Mark Scheme

2009 examination – January series

STANDARDISATION

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.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

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Registered address: AQA, Devas Street, Manchester M15 6EX *Dr Michael Cresswell Director General*

ADDITIONAL APPLIED SCIENCE GCSE AASC/2H MARK SCHEME
JANUARY 2009

question	answers	extra information	marks
1(a)(i) **E**	person 1 = 7.1(g) person 3 = 8.4(g)		1 1
1(a)(ii) **E**	person 1 *or* person 3	Allow ecf from (i)	1
1(a)(iii) **E**	**two** from: • less processed foods / less takeaway foods/ *less fast food/ junk food* • low salt varieties/ *less salty food* • do not add salt to food	*Do not allow check labels for salt content*	2
1(a)(iv) **E**	high blood pressure / heart attack / *stroke*	*Allow kidney disease / heart disease / failure* *Ignore heart problems or high cholesterol*	1

1(b)(i) **E**	**two** from: • giant lattice • held together by strong *bonds/* forces of attraction • between +ve and –ve *(oppositely* charged) ions • *made of a metal and a non-metal*	*Allow opposite charges attract*	2
1(b)(ii) **A**	801 °C		1
Total			**9**

ADDITIONAL APPLIED SCIENCE GCSE AASC/2H MARK SCHEME
JANUARY 2009

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

question	answers	extra information	marks
2(b)(iii) **E**	**three** from: • wear eye protection • clean wire loop/ *dip* in HCl *and put in flame* • repeat until the wire doesn't produce any colour in flame • dip loop in sample • place in hot / *blue / roaring* flame • record / *identify* colour of flame If candidate uses splint instead of loop: • *wear eye protection* • dip in sample • place in hot / *blue / roaring* flame • record/ *identify* colour of flame	*Ignore sterilise* *Allow observe /see what colour the flame is* *Allow observe /see what colour the flame is*	3 1 1 1

2(b)(iv) **E**	**one** from: • use clean equipment • no contaminants in reagents • use distilled water	*Ignore repeat* *Ignore sterilise*	1
Total			**9**

ADDITIONAL APPLIED SCIENCE GCSE AASC/2H MARK SCHEME
JANUARY 2009

question	answers	extra information	marks
3(a)(i) **E**	marathon		1
3(a)(ii) **E**	• last longer/ *longer distance/ most running / idea of more time* • use (a lot of) energy/ *produces heat/ temperature rise/ <u>more</u> work done*		1 1
3(b)(i) **E**	• *water* • *glucose/ sugar* • *electrolytes/ salt/ sodium chloride*		1 1 1
3(b)(ii) **E**	polyester / lycra / nylon / *acrylic / polypropylene / cotton / wool / linen / silk*	*Allow Spandex* *Not plastic, PVC, polythene, polystyrene, synthetic wool*	1

3(b)(iii) **E**	Any **three** from: • light(weight) / low density • flexible • durable/ *hard wearing/ long lasting* • dries quickly/ *wicking / lets sweat out* • *can be dyed/* bright colours/colourfast • stain resistant / *easy to clean*	*Ignore reference to thin / cost / shrinking / strength* *Allow comfortable* *Do <u>not</u> accept keeps you cool* *Allow does not absorb sweat*	3
Total			**10**

question	answers	extra information	marks
4(a) **E**	finding out what substances are in a sample	*Allow:* • *what is present in a sample* • *analysing substances using different tests or equivalent*	1
4(b)(i) **E**	any **four** from: • thin layer of powder applied to a thin plate • sample placed at one end of plate/ *paper/ mention of origin or line* • immersed in solvent • solvent moves up the plate/ *paper* • *ink/ sample mixture travels up the plate/ paper* • at different speeds • *ink/ different components/ colours separate*		4
4(b)(ii) **E**	• run sample of *the* two different inks • compare/ *match* the chromatograms / runs / pattern / colours /*lines*		1 1

4(b)(iii) **E**	**One** of: • faster runs • *clearer* separation / clearer runs/ *easier to analyse* — *Accept better separation/ more accurate* • *can use for small samples*	1

question	answers	extra information	marks
4(c) **E**	any **two** from: • fingerprints • DNA (from blood) • blood group/ *type* • handwriting/ *signature*	*Not just blood* *Ignore hair/ fibres*	2
Total			**10**

ADDITIONAL APPLIED SCIENCE GCSE AASC/2H MARK SCHEME
JANUARY 2009

question	answers	extra information	marks
5(a)(i) **E**	friction / drag	*Not water resistance*	1
5(a)(ii) **E**	any **two** from: • smooth fabric / designed to reduce drag • tight fitting/ *more steamlined* • slippery • *cover the head/ hair*	*Ignore lighter/ thinner* *Allow aerodynamic*	2
5(b) **E**	*Both bodysuits similar/* bodysuits do not improve / *reduce resistance to movement* as speed / velocity increases so does friction / resistance/ *velocity affects resistance*		1 1
5(c)(i) **E**	*Label between lines for tidal volume* *Clearly labelled on vertical for vital capacity*	*If volume correct in 5C(ii) allow labelling of vital capacity*	*1* *1*
5(c)(ii) **E**	4500 ml ± 200	allow ecf	1

5(c)(iii) **E**	spirometer		1
5(d)(i) **E**	use glucose *release/ supply* energy	*Ignore produces*	1 1
5(d)(ii) **E**	aerobic uses oxygen / *releases* more energy/ *does not produce lactic acid*	*Not just air* *Assume 'it' refers to aerobic respiration*	1
Total			**12**

ADDITIONAL APPLIED SCIENCE GCSE AASC/2H MARK SCHEME
JANUARY 2009

question	answers	extra information	marks
6(a)(i) **E**	more plants that are grown / more overcrowding smaller / shorter the plants/ *they grow less*	accept converse *Do not allow better*	1 1
6(a)(ii) **E**	more competition for: (any two) • light • water • nutrients • *space*	*Allow food or specific nutrient e.g. nitrate*	2
6(b)(i) **E**	pesticides / fungicides / herbicides / fertiliser/ *insecticides/ greenhouse/ polytunnel*	*Accept manure/ selective breeding/ genetically modified organism* *<u>Not</u> light* *Ignore chemicals/ nutrients*	1

question	answers	extra information	marks
6(b)(ii) **E**	**Fertiliser:** • drain into waterways • pollute water / eutrophication • *kills aquatic organisms* or **Pesticides:** • found in o*ther* organisms • *drains into waterways* • (build up) in food chains/ *poisons animals* • remove food for other organisms (birds) or **Herbicides** • *kills other plants* • remove food for other organisms • *poisons animals*	*Must link to 6(b)(i)* *Accept suitable answers* *Allow methane when linked to manure* *Do not allow vague references to kill organisms*	2

question	answers	extra information	marks
6(c) **E**	*Allow one or two suggestions(♦) linked to one or two explanations (●)* ♦ larger • can push out native ladybirds • eat more food (so not so much for native species) ♦ faster breeding cycle • population increases more quickly • eat more food (so not so much for native species) ♦ wider habitat ♦ wider food range • better survival rate	*Ignore references to temperature*	3
Total			**10**