Version 1.0: 2009*06*

ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Secondary Education

Science: Double Award (Modular) 3468/1F

Specification A

Mark Scheme

2006 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.

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.

Science: Double Award (Modular)

Summer 2006 3468/1F

3468/1F Q1

question	answers	extra information	mark
(a)(i)	rock/stone/amber/resin/any named rock or rock type e.g. sedimentary/metamorphic	allow peat/coal/clay reject tree sap allow soil/mud/sand/ice	1
(ii)	decayed/bacterial action	allow rotted/decomposed disintegrated/degraded are neutral	1
(b)(i)	eohippus		1
(ii)	any **two** from: • pliohippus bones longer/ bigger/wider/thicker • comparison of hoof shapes • pliohippus has fewer bones/toes	 stronger bones is neutral must make a comparison it = mesohippus reject feet/ideas of bones fused together ignore actual number of bones if comparison is correct	2
total			5

3468/1F Q2

question	answers	extra information	mark
(a)	• P nucleus • Q chromosome • R gene		1 1 1
(b)	• ovary • womb • fertility • contraceptive		1 1 1 1
total			7

3468/1F Q3

Question	answers	extra information		mark
(a)(i)	He	allow helium	ignore letter case	1
(ii)	Br	allow bromine/Br2/bromide	allow phonetic spellings	1
(iii)	Li	allow lithium	allow answers indicated on diagram	1
(iv)	F	allow fluorine/F2/fluoride		1
(b)	• low • poor/bad/weak/not			1 1
(c)	• number • period • group			1 1 1
total				9

3468/1F Q4

question	answers	extra information	mark
(a)	Z	all four correct gains 3 marks three **or** two correct gains 2 marks one correct gains 1 mark	3
(b)	W		
(c)	X		
(d)	Y		
total			3

3468/1F Q5

question	answers	extra information	mark
(a)	• ray emerges and is to right of normal • ray rotated anticlockwise	reject multiple rays	1 1
(b)	• speed • refraction		1 1
(c)	e.g. endoscope/cable tv/internet	allow function e.g. looking inside someone/sending signals/lamps/ decorations/where light needs to bend around corners.	1
total			5

3468/1F Q6

question	answers	extra information	mark
(a)	• gamma • ultraviolet • infra red • radio	all four correct for 3 marks three **or** two correct for 2 marks one correct for 1 mark	3
(b)	*Quality or written communication 1 mark for correct use of any **three** of radiation, ultraviolet, infra red, cell, mutation, chromosome, gene, cancer, DNA* any **three** from: • damage/harm/burn to skin • cancer • cells • infra red • ultraviolet • mutation • chromosomes damaged • genes damaged • dehydration	 allow sunburn 'skin cancer' equivalent to first 2 bullet points allow reference to DNA allow heatstroke **or** sunstroke	1 3
total			7

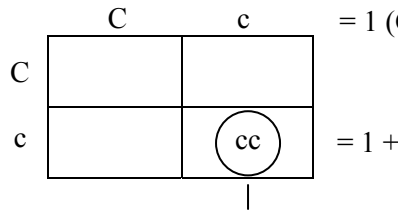
3468/1F Q7

question	answers	extra information	mark
(a)	Platinum/Pt	ignore letter case	1
(b)	Copper/Cu		1
(c)	Silver/Ag		1
(d)	Sodium/Na		1
total			4

3468/1F Q8

question	answers	extra information	mark
(a)	all three plots correct all labels present (in correct relative proportions)	allow 1 mark for 1 **or** 2 correct plots	2 1
(b)	• skin • lungs • liver • kidney • bladder		1 1 1 1 1
total			8

3468/1F Q9

question	answers	extra information	mark
(a)	• XY **or** YX • Y • XY **or** YX		1 1 1
(b)	*Quality of written communication* *1 mark for the correct use of any* ***three*** *of:* *gene (not recessive gene), allele, dominant, recessive, carrier, homozygous, heterozygous* any **three** from: • caused by recessive allele • need two (recessive) alleles to get condition/homozygous recessive • one (allele) from mother and one from father • parents **both** carriers/heterozygous/both have the gene or allele marks available from diagram: Cc x Cc = 1 (both parents carriers) = 1 (one allele from each parent) cc = 1 (needs 2 recessive alleles) identified as cystic fibrosis **or**  = 1 (Cc **and** Cc for both parents needed) = 1 + 1 (equivalent to one allele from each parent and needs two alleles) identified as cystic fibrosis	allow recessive gene/allow faulty gene **or** faulty allele allow (recessive) gene	1 3
total			7

3468/1F Q10

question	answers	extra information	mark
(a)	any **two** from: • uses no/less water **or** no plucking needed • no/less need for air conditioning • no/less food goes to producing feathers		2
(b)	any **two** from: • unable to mate • susceptible to temperature variations • susceptible to sunburn		2
total			4

3468/1F Q11

question	answers	extra information	mark
(a)	• LHS sodium chloride + water • RHS sodium hydroxide + hydrogen + chlorine	do **not** accept sodium chlorine accept hydrogen oxide/hydroxide do **not** accept chloride ignore state symbols and numbers	1 1
(b)	2(NaCl) 2 (H_2O) 2 (NaOH)	all correct allow multiples if whole equation correctly balanced	1
(c)	aqueous	allow dissolved in water solution is neutral mention of liquid negates answer	1
total			4

3468/1F Q12

question	answers	extra information	mark
(a)	gas **or** gaseous	vapour neutral	1
(b)	–150 to –155	**must** have minus sign for mark	1
(c)	any **two** from: • as atomic number/mass number/atomic mass/proton number increases, boiling point increases • boiling point increases from helium to radon/boiling point increases down the group • not directly related/ proportional/rises quickly at first then more slowly		2
(d)	• 2 electrons on inner ring • 8 electrons on outer ring	do **not** award if extra rings drawn	1 1
total			6

3468/1F Q13

question	answers	extra information	mark
(a)	• 0.59 **or** 0.588 **or** 59% **or** 58.8% **or** 200 / 340 **or** 10 / 17 gains 2 marks	evidence of: 200 / 30 + 28 + 10 + 28 + 44 + 200 gains 1 mark do **not** allow '60' without correct working shown allow error carried forward in denominator	2
(b)	• alpha **and** beta **and** gamma	all three in any order accept correct greek symbols references to rays/particles are neutral	1
(c)	• gamma/beta • can penetrate (cells or skin)	marking points are independent	1 1
total			5

3468/1F Q14

question	answers	extra information	mark
(a)	mainly empty space	do **not** accept space between atoms	1
(b)	(repelled/reflected) by positive charge	allow repelled/reflected by nucleus/proton allow gold atoms/particles have positive charge reject gold/leaf positively charged	1
(c)	any **three** from: • a nucleus • nucleus containing protons • nucleus containing neutrons • electrons outside the nucleus	allow marks on labelled diagram reference to charges neutral allow electrons in orbits/shells if no marks gained allow one mark for proton, neutron and electron	3
total			5

3468/1F Q15

question	answers	extra information	mark
(a)	8 gains 2 marks	else evidence of 20 × 40 / 100 gains 1 mark	2
(b)	(C) • (B) 82 • (C) 84	ignore letter but give one mark for each correct calculation	 1 1
(c)	• digested • absorbed/diffuse/taken into/ passes into • into blood	allow broken down/decomposed dissolved is neutral reject disintegrated allow correct digestive enzyme + substrate for 1 mark each to max 2 i.e. protease + protein carbohydrase/amylase + carbohydrate/starch lipase + fat/lipid incorrect references to enzymes are neutral	1 1 1
total			7

3468/1F Q16

question	answers	extra information	mark
(a)	• increase in temperature increases number of bubbles • increase greater at lower temperatures	explanations neutral since asked for a description accept increases up to 20°C **or** stays constant after 20°C	1 1
(b)	• temperature not limiting/some other factor limiting • light/carbon dioxide		1 1
total			4