



# General Certificate of Secondary Education

## Science: Single Award (Modular)

3469H

*Specification A*

# Mark Scheme

*2005 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.

**3469H Q1**

question	answers	extra information	mark
(a)	any <b>three</b> from:  factor for colour has two forms  yellow dominant  since <u>all</u> first generation yellow  green recessive  since reappears in second generation	accept gene for factor and allele for form   accept F1 for first generation   accept F2 for second generation	3
(b)(i)	genes	accept alleles / genetic	1
(ii)	nucleus	accept chromosomes / DNA	1
total			5

**3469H Q2**

question	answers	extra information	mark
(a) 1	for insulation / prevents heat loss	keeps cold out is neutral keeps it warm is neutral	1
2	camouflage / other animals cannot see it		1
(b) 1	heat loss	reject shade	1
2	insulation from hot sand / prevents heat passing from sand / prevents burning		1
total			4

**3469H Q3**

question	answers	extra information	mark
(a)	(i) liquid (ii) solid	allow l allow s allow responses written in table	1 1
(b)	fluorine	accept F, reject fluoride	1
(c)	hydrogen bromide	reject hydrogen bromine accept HBr / BrH allow responses written in table	1
total			4

**3469H Q4**

question	answers	extra information	mark
(a)(i)	bread / beer / wine / alcohol		1
(ii)	yoghurt	accept cheese	1
(b)(i)	(Y) <u>more</u> gas / carbon dioxide given off		1
(ii)	(X) curve / slope steeper	accept rises more rapidly / <u>only</u> took 30 seconds	1
(iii)	(flat) since calcium carbonate / substrate all used up	accept the reaction has stopped / no more gas is being produced	1
(iv)	lime water / calcium hydroxide solution turns milky / cloudy	reject extinguishes lighted splint	1 1
total			7

**3469H Q5**

question	answers	extra information	mark
(a)	protons		1
	protons	accept electrons	1
	neutrons		1
(b)(i)	2 weeks	if answer is incorrect 2 gains two marks weeks gains one mark half of 68 or 34 gains one mark allow working shown on graph	3
(ii)	protons	reject mass	1
total			7

**3469H Q6**

question	answers	extra information	mark
	<b><i>Quality of written communication</i></b> correct use of three <u>scientific</u> terms from organism, microbe, fossil, rock, atmosphere		1
	any <b>three</b> from:		3
	living organisms / microbes / named microbes	accept life reject signals / radio messages	
	fossils / fossil fuels	accept evidence that life has existed	
	chemical changes		
	rocks / chemical elements / soil		
	atmosphere / gases / named gases weather / climate		
	temperature		
	water		
	radiation / radioactivity		
seismology / gravity	accept 'earthquakes'		
total			4

**3469H Q7**

question	answers	extra information	mark
(a)	insulation	allow example e.g fibreglass	1
	double glazing	allow curtains	1
	draught excluder	allow double glazing / close fitting door  allow turning down thermostat once only / turn down the heating	1
(b)	transfers more useful energy	allow converts more energy into light / less into heat / less energy wasted	1
total			4

**3469H Q8**

question	answers	extra information	mark
(a)(i)	88.1	reject 88	1
(ii)	increases		1
(iii)	smoking decreases life expectancy gains one mark  BUT quantitative statement e.g. reduces life expectancy by 7.5 years for 25-29 age group gains two marks  the lower the age, the greater the effect on life expectancy gains one mark  BUT quantitative statement e.g. effect at 25-29 more than double that at 70-74 gains two marks	comparison with females is neutral	3
(b)	(evidence for link)	must be stated or else zero marks statements must relate to the data	
	majority of people who get lung cancer are smokers	reject majority of smokers get lung cancer	1
	but some non smokers get lung cancer		1
total			7

**3469H Q9**

question	answers	extra information	mark
(a)(i)	meiosis		1
(ii)	mitosis		1
(b)	(sheep <b>X</b> ) nucleus comes from <b>X or</b> nucleus of egg from <b>Y</b> removed		1
		genetic material / genetic information / genes / DNA / chromosomes comes from <b>X</b>	1
(c)(i)	<b>X</b> pituitary  <b>Y</b> FSH		1
			1
(ii)	stimulates LH production  inhibits FSH production / production of <b>Y</b>		1
			1
total			8

3469H Q10

question	answers	extra information	mark
(a)	<p>(reject)</p> <p>any <b>two</b> from:</p> <p>giraffe spend almost all of the dry season feeding from low bushes</p> <p>only in the wet season do they feed from tall trees, when new leaves are plentiful</p> <p>females spend over 50% of their time feeding with their necks horizontal</p> <p>both sexes feed faster and most often with their necks bent</p>	if support then zero marks	2
(b)	<p>any <b>two</b> from:</p> <p><u>mutations</u> produce male giraffes with longer necks</p> <p><b>either</b></p> <p>male giraffes with longer neck more likely to win fight / more likely to mate with female</p> <p><b>or</b></p> <p>females prefer long necks / more likely to mate with long necked male</p> <p>their genes more likely to pass to next generation</p>	accept long necks inherited or offspring have long necks	2
total			4

**3469H Q11**

question	answers	extra information	mark
(a)(i)	same number of electrons	allow all have 7 electrons	1
	in outermost shell		1
(ii)	fluorine has fewer shells than iodine / less shielding		1
	gains electrons more easily / more pull		1
(b)	outermost shell full		1
	no tendency to lose / gain electrons		1
total			6

**3469H Q12**

question	answers	extra information	mark
(a)	2 and 3	both needed	1
(b)(i)	atomic number / proton number	electrons neutral	1
(ii)	argon has more neutrons	accept more particles in nucleus	1
(iii)	increases		1
	by one with each element		1
total			5



**3469H Q13**

question	answers	extra information	mark
(a)	12.7		1
(b)	the further away, the faster it is moving away		1
(c)	all galaxies have been moving away from us for approximately the same length of time		1
	therefore they were all probably produced at the same time		1
total			4

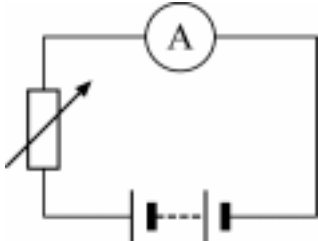
3469H Q14

question	answers	extra information	mark
(a)(i)	X – digital  Y – analogue	both for one mark	1
(ii)	any <b>two</b> from:  higher quality / less interference  more information / data  less amplification needed / less weakening of signal	faster neutral  cheaper neutral	2
(b)(i)	<b>Quality of written communication</b> correct use of <b>three</b> <u>scientific</u> terms from speed / velocity, reflection, density, time, boundary  any <b>three</b> from:  different tissues have different densities  ultrasound travels at different speeds / velocities in different tissues  reflection  from tissue boundaries  time taken to return	accept bouncing back	1  3
(ii)	cleaning (delicate instruments)  by using ultrasound in <u>liquids</u>  <b>OR</b> detecting flaws  by measuring time taken for reflection / ultrasound reflected from flaw  <b>OR</b> breaking kidney stones by vibrations		1  1  <b>OR</b> 1  1
total			9

## 3469H Q15

question	answers	extra information	mark
	any <b>three</b> from:  heat produced by muscles  <u>during</u> exercise  by respiration  (skin) temperature over muscles rises / more blood to skin over muscles	accept <u>when</u> working  allow vasodilation <b>or</b> arterioles dilate over muscles reject capillaries dilate sweating neutral	3
total			3

## 3469H Q16

question	answers	extra information	mark
(a)			3
	one mark for each symbol max. 2 marks if symbols incorrectly joined	allow more than 2 cells allow rheostat arrow in either direction	
(b)	current will decrease  since resistance greater		1  1
total			5

**3469H Q17**

question	answers	extra information	mark
(a)	hydrocarbon		1
(b)	thermal decomposition / cracking		1
(c)(i)	making polymers / poly(e)thene	accept plastic (bags)	1
(ii)	fuel		1
total			4