



# General Certificate of Secondary Education

## Science: Single Award (Modular)

3469F

*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.

**3469F Q1**

question	answers	extra information	mark
(a)	agilisaurus / camarasaurus / ornitholestes		1
(b)	eorapter	allow lagosuchus	1
(c)	lagusuchus (it) walks on hind limbs / two limbs / alamosaurus has <u>longer</u> neck / lagusuchus has back legs longer than front but alamosaurus has the reverse		1
(d)(i)	alamosaurus		1
(ii)	increased		1
(e)	from hard parts / bones / imprints e.g. footprints / parts replaced by other materials / conditions for decay absent or example	buried is neutral	1
(f)	simple billion		1 1
total			8

**3469F Q2**

question	answers	extra information	mark
(a)	carbon dioxide methane greenhouse effect		1 1 1
(b)	coal / oil / gas / peat / petrol / paraffin		1
total			4

**3469F Q3**

question	answers	extra information	mark
(a)	He		1
(b)	carbon / silicon / germanium / tin / lead	accept correctly written symbols C / Si / Ge / Sn / Pb	1
(c)	copper	accept Cu	1
(d)	iodine	accept I or I <sub>2</sub>	1
total			4

**3469F Q4**

question	answers	extra information	mark
(a)	A – electron		1
	B – nucleus		1
	C – proton		1
	D – neutron		1
(b)	Group 1 / alkali metals has one electron in outer shell	accept 3 protons / 3 electrons / atomic number 3 therefore lithium (so Group 1 / alkali metals)	1 1
(c)	lithium	accept Li	1
total			7

**3469F Q5**

question	answers	extra information	mark
	sunbed – ultraviolet		1
	broken bones – X-rays		1
	mobile phone – microwaves		1
	surgical instruments – gamma (rays)		1
	remote control – infra red		1
total			5

**3469F Q6**

question	answers	extra information	mark
(a)	Jupiter		1
(b)	Mercury and Venus	both needed	1
(c)	Pluto		1
(d)	further away (from the Sun than Earth)		1
total			4

**3469F Q7**

question	answers	extra information	mark
	<b>Quality of written communication</b>		1
	correct use of <b>three scientific</b> terms e.g. radiation / $\alpha$ or $\beta$ or $\gamma$ / cells / ionisation / mutation (not cells or body) / chromosomes / DNA / genes / cancer		
	any <b>three</b> from:		3
	(materials emit) radiation		
	named type of radiation ( $\alpha$ or $\beta$ or $\gamma$ )		
	damage / harm / kill	dangerous is neutral	
	cells / chromosomes / DNA / genes		
	cancer		
	mutations		
	ionisation		
	gloves or glass absorb radiation / prevent radiation reaching body or cells		
total			4

**3469F Q8**

question	answers	extra information	mark
(a)	falls from 0.25 to 0.19 but by 0.06 gains two marks	if <u>neither</u> figure given, accept steadily / at constant rate for one mark accept mass of oxygen inversely related / negative correlation to height above sea level for 2 marks	1 1 1
(b)(i)	1.8	accept correct readings from graph for (5 and 6.8) if subtraction incorrect for one mark allow one mark for correct subtraction from incorrect readings	2
(ii)	(blood can carry) <u>more</u> oxygen		1
total			6

**3469F Q9**

question	answers	extra information	mark
(a)	all plots correct all sectors correctly labelled	3 <b>or</b> 2 plots correct gains 1 mark	2 1
(b)(i)	(fractional) distillation		1
(b)(ii)	gases		1
(b)(iii)	bitumen		1
total			6

**3469F Q10**

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

**3469F Q11**

question	answers	extra information	mark
(a) 1	for insulation / prevents heat loss	keeps cold out neutral keeps it warm 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

**3469F Q12**

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

**3469F Q13**

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

**3469F Q14**

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

**3469F Q15**

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



**3469F Q16**

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

**3469F Q17**

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  but some non smokers get lung cancer	reject majority of smokers get lung cancer	1  1
total			7