



General Certificate of Secondary Education

Science: Double Award (Modular)

3468/1H

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.

3468/1H Q1

question	answers	extra information	mark
(a)	any three 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

3468/1H Q2

question	answers	extra information	mark
(a)	any two for one mark each birth control pills are 99 % effective in preventing pregnancy the hormones in the pills give protection against some women's diseases the woman's monthly periods become more regular	answers should relate the ideas in the list condom (neutral)	2
(b)	any two for one mark each the hormones in the pills have some rare but serious side effects only 99% effective this method of birth control provides no protection against sexually transmitted disease a woman has to remember to take a pill every day	answers should relate the ideas in the list	2
total			4

34681H 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

3468/1H Q4

question	answers	extra information	mark
(a)	LHS lithium + water	accept Li and H ₂ O accept hydrogen oxide for water	1
	RHS hydrogen + lithium hydroxide	accept H ₂ and LiOH ignore attempts at balancing ignore charges	1
(ii)	lighted splint / flame 'pop'	reject glowing splint	1
			1
(b)	<p>Quality of written communication One mark for the correct use of any three of the terms atom, covalent, bond(ing), saturated, hydrocarbon or alkane</p> <p>any three from:</p> <p>one / the carbon (atom)</p> <p>four hydrogen (atoms)</p> <p>CH₄</p> <p>hydrocarbon</p> <p>saturated / single bond</p> <p>covalent bond / shared electrons</p> <p>alkane</p>	reject molecules once	1
		shape / properties neutral reject ionic bond	3
total			8

3468/1H Q5

question	answers	extra information	mark
(a)	D		1
(b)	C		1
(c)	B		1
total			3

3468/1H Q6

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

3468/1H Q7

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

3468/1H Q8

question	answers	extra information	mark
	gold – A		1
	iron – C		1
	magnesium – D		1
	potassium – B		1
total			4

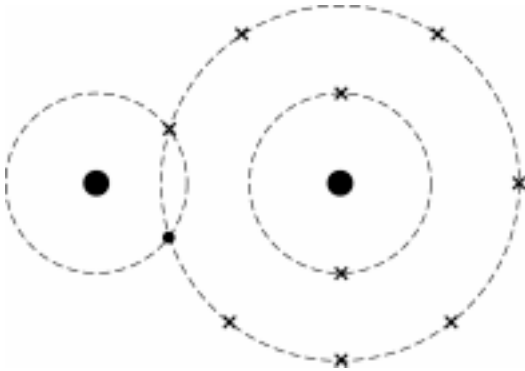
3468/1H Q9

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

3468/1H Q10

question	answers	extra information	mark
(a)	<p>(reject)</p> <p>any two 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>	<p>if support then zero marks</p>	2
(b)	<p>any two from:</p> <p><u>mutations</u> produce male giraffes with longer necks</p> <p>either</p> <p>male giraffes with longer neck more likely to win fight / more likely to mate with female</p> <p>or</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>	<p>accept long necks inherited or offspring have long necks</p>	2
total		4	

3468/1H Q11

question	answers	extra information	mark
(a)	fluorine has fewer shells / less shielding than iodine		1
	gains electrons more easily / more pull		1
(b)(i)			1
(ii)	weak forces	accept weak bonds	1
	between <u>molecules</u> / intermolecular	reject intramolecular	1
(c)	$2\text{F}^- - 2\text{e}^- \rightarrow \text{F}_2$		1
total			6

3468/1H 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

3468/1H Q13

question	answers	extra information	mark
(a)(i)	X – digital Y – analogue	both for one mark	1
(ii)	any two from: higher quality / less interference more information / data less amplification needed / less weakening of signal	faster neutral cheaper neutral	2
(b)(i)	Quality of written communication correct use of three <u>scientific</u> terms from speed / velocity, reflection, density, time, boundary any three 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)	0.0008 (0.00079) / 8×10^{-4} / 7.9×10^{-4} gains two marks	7.9^{-04} gains one mark else wavelength = wave speed / frequency or 1585 / 2 000 000 gains one mark	2
total			9

3468/1H Q14

question	answers	extra information	mark
(a)(i)	(strontium-90) beta rays <u>partly</u> absorbed by aluminium	accept gamma rays not absorbed and alpha all absorbed if phosphorus -32 then one mark max for beta ray explanation	1
	long half life means it can be <u>used</u> for a long time		1
(ii)	(technetium-99) (gamma) rays will <u>pass out</u> of body / less likely to be absorbed	accept (gamma) less damaging or alpha / beta will damage cells if cobalt -60 then one mark max for gamma ray explanation	1
	short half life means it will <u>not</u> affect body over a long period		1
(b)	neutron becomes proton / neutron emits electron / neutron emits beta particle	gains proton neutral	1
total			5

3468/1H Q15

question	answers	extra information	mark
(a)	conducts electricity		1
	density low		1
(b)	any two from:		2
	unreactive (with water)		
	forms compounds with covalent bonds		
	high melting point		
total			4

3468/1H Q16

question	answers	extra information	mark
	any three 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 or arterioles dilate over muscles reject capillaries dilate sweating neutral	3
total			3

3468/1H Q17

question	answers	extra information	mark
(a)	respiration no photosynthesis because no light	reject start respiring / respire only at night	1 1
(b)	photosynthesis rate greater than respiration rate photosynthesis since light	reject no respiration / photosynthesis only	1 1
total			4