



## General Certificate of Secondary Education

# Science: Single Award 3463/1H *Specification B (Co-ordinated)*

## 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.

## Single Award Higher Tier 3463/1H

### 3463/1H Q1

question	answers	extra information	mark
(a)(i)	liver		1
(ii)	<u>on diagram</u> :  'X' on liver	must be unambiguous (eg not overlapping gall bladder) intersection of X in liver	1
(b)	stomach  <u>small</u> intestine	accept duodenum or ileum extra wrong answers cancel the mark, eg small intestine (colon) = no marks	1 1
(c)	amylase not produced by stomach  acid / low / wrong pH in stomach <b>or</b> enzyme would be denatured in stomach <b>or</b> amylase only works in neutral / alkaline conditions	accept no starch digesting enzymes in the stomach accept correct enzyme not in stomach accept <u>only</u> proteases in stomach do <b>not</b> accept protease does not digest starch  incorrect extra information cancels mark do <b>not</b> accept amylase does not work in the stomach	1  1
(d)	any <b>three</b> from:  • non-digestible / insoluble matter in faeces or fibre / roughage in faeces  • <u>water</u> absorption / <u>water</u> removed (into blood)  • by <u>large</u> intestine / colon / rectum  • by osmosis / diffusion	ignore 'solid' accept cannot be broken down  cancel mark if list of materials	3
total			9

## 3463/1H Q2

question	answers	extra information	mark
(a)(i)	remains of an organism in rock / amber / coal / ice / tar <b>or</b> remains of an organism which lived long ago	accept bones, shells or impression for ‘remains’	1
(ii)	<ul style="list-style-type: none"> <li>• fossils show changes</li> <li>• <u>over</u> time</li> </ul>	do <b>not</b> accept just ‘evolved’	1
		<b>not</b> just a past event	1
(b)	<p><b>Quality of written communication</b></p> <p>any <b>two</b> from:</p> <p>mutation occurs in bacteria or change in DNA / gene occurs</p> <p>(when antibiotic used) only resistant bacteria survive <b>or</b> non-resistant bacteria are killed <b>or</b> reference to ‘natural selection’</p> <p>resistant bacteria pass on the gene / allele</p>	for correct use of at least <b>two</b> scientific terms eg mutation, resistant ( <b>not</b> just ‘antibiotic- resistant’, <b>not</b> ‘immune’) / selection / natural selection / survival / reproduction / gene / allele / DNA	1
		cancel if mutation ‘caused by’ antibiotic	2
total		allow pass on the mutation do <b>not</b> accept just ‘pass on resistance’	6

3463/1H Q3

question	answers	extra information	mark
(a)	345 to 350	ignore working or lack of working  use of 355 to 360 <b>and</b> 10 for <b>1</b> mark	2
(b)	any <b>two</b> from:  <u>more</u> sweating (at 37.6°C)  <u>more</u> water loss <b>or</b> dehydration <u>occurs</u>  blood becomes (more) concentrated / (more) salty <b>or</b> need to replace water  stimulation of the hypothalamus	'more' at least once in the first 2 points  do <b>not</b> accept prevents dehydration only	2
(c)	any <b>three</b> from:  evaporation  of <u>water</u>  cools skin <b>or</b> uses heat from skin  cools blood / heat from blood (passing through skin)	do <b>not</b> accept just water loss unqualified    related to sweating cooling the blood ignore vasodilation	3
total			7

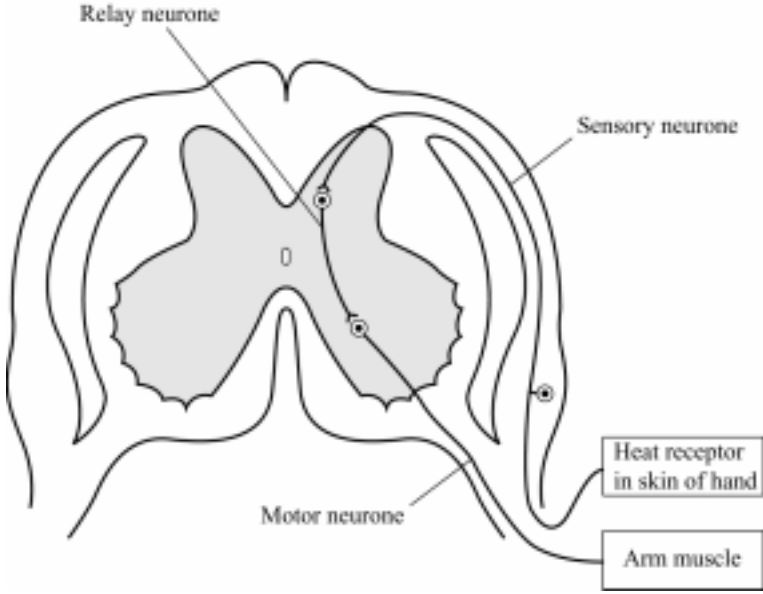
**3463/1H Q4**

question	answers	extra information	mark
(a)(i)	haemoglobin / oxyhaemoglobin	must be phonetic	1
(ii)	carries oxygen <b>or</b> forms oxyhaemoglobin	ignore references to CO <sub>2</sub> / iron cancel if extras like food / glucose	1
	from lungs to tissues		1
(b)	no nucleus <b>or</b> biconcave disc (described)	ignore references to size ignore vague references to being 'round' / 'donut' shaped etc.	1
(c)	any <b>three</b> from: <ul style="list-style-type: none"> <li>• combines with haemoglobin / with red pigment</li> <li>• irreversibly</li> <li>• <u>less</u> oxygen transport <b>or</b> <u>less</u> oxygen (to fetus)</li> <li>• <u>less</u> energy release <b>or</b> <u>less</u> respiration (in fetus)</li> <li>• <u>less</u> growth of fetus <b>or</b> <u>lower</u> birth mass</li> </ul>	do <b>not</b> accept any wording suggesting zero oxygen     do <b>not</b> accept 'does not grow properly'	3
total			7

3463/1H Q5

question	answers	extra information	mark
	<p>any <b>three</b> from adaptation <b>and</b> effect:</p> <p>few leaves / no leaves / little growth above ground / low surface area above ground</p> <p>so less water loss</p> <p><u>deep</u> roots</p> <p>so can reach water <b>or</b> because surface soil is likely to dry out</p> <p>roots near surface</p> <p>so can obtain water when it does rain</p> <p>widespread roots or many roots</p> <p>so can obtain water from a large area</p> <p>swollen stem so can store water</p>	<p>ignore references to ions throughout</p> <p>ignore animals eating plant</p> <p>do <b>not</b> accept zero water loss</p> <p>accept 'moisture' for water</p>	<p>3</p>
<p>total</p>		<p>3</p>	

3463/1H Q6

question	answers	extra information	mark
(a)	 <p>sensory neurone correctly drawn <b>and</b> labelled</p> <p>motor neurone correctly drawn <b>and</b> labelled</p>	<p>from receptor + via dorsal root + cell body in ganglion + synapse to relay neurone</p> <p>to muscle + via ventral root + same shape as relay neurone + synapse with relay neurone</p> <p><b>OR</b> correct <u>pathways</u> for both neurones given (ie without synapse or cell bodies) <b>and</b> labelled, <b>or</b> correctly <u>drawn</u> but unlabelled = 1 mark for this part)</p>	<p>1</p> <p>1</p>
(b)	<p>any <b>two</b> from:</p> <p>reference to synapses / gaps between neurones</p> <p>extra time for release / movement of chemical</p> <p>extra time for development of muscle 'tone' / tension</p>		2
total			4

**3463/1H Q7**

question	answers	extra information	mark
	any <b>three</b> from:  FSH stimulates growth / maturing of follicle(s) / eggs  FSH stimulates oestrogen release  oestrogen stimulates development of uterus lining  oestrogen stimulates LH <u>release</u> / <u>production</u>  LH stimulates ovulation / egg release		3
total			3



**3463/1H Q8**

question	answers	extra information	mark
(a)(i)	<b>Aa</b> or <b>aA</b>		1
(ii)	allele / gene for vestigial wings / <b>a</b> is recessive <b>or</b> vestigial is recessive <b>or</b> <b>A</b> is dominant <b>or</b> <b>A</b> would override the effect of <b>a</b> <b>or</b> <b>A</b> present gives long wings		1
(b)	parental genotypes correct – both <b>Aa</b>	NB can pick up chain of logic at any point correctly derived from candidate's previous point	1
	gametes correctly derived from <b>P</b> genotypes		1
	offspring genotypes correctly derived from gametes		1
	<b>3:1</b> ratio recognised	wrong cross and not 3:1 ratio = max 2	1
total			6