



## General Certificate of Secondary Education

# Biology (Modular) 3413/F

## *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.



**GCSE BIOLOGY (MODULAR) 3413/F**  
**MARK SCHEME – FOUNDATION TIER (TERMINAL PAPER)**  
**SUMMER 2005**

**3413/F Q1**

	answers	extra information	mark
(a)	3 bars correctly plotted	tolerance = ½ small square	1
	all bars correctly plotted		1
(b)	1800 – 1850		1
(c)	any <b>three</b> from <ul style="list-style-type: none"> <li>• to provide land for buildings/ houses/shops/industry</li> <li>• to provide land for farming</li> <li>• to provide land for roads</li> <li>• to make a quarry</li> <li>• to provide land for dumping waste</li> <li>• (timber) for fuel</li> <li>• (timber) for building/making objects</li> <li>• (timber) for paper</li> </ul>	do <b>not</b> accept forest fires  accept timber unqualified as an alternative to final 3 marking points	3
(d)	loss of habitat/shelter	accept fewer places to live	1
	less food available		1
total			8

**3413/F Q2**

	answers	extra information	mark
	<b>Quality of written communication</b>		
	one mark for correct use of terms, e.g. camouflage, surface area, predator, prey	at least two	1
	any <b>five</b> from <ul style="list-style-type: none"> <li>• large ears</li> <li>• (large ears) provide large surface area for heat loss</li> <li>• light brown – provides camouflage (in desert)</li> <li>• small size – large surface area to volume ratio</li> <li>• avoids heat by sheltering (in day)</li> <li>• hunts at night when it is cooler</li> </ul>		5
total			6

**3413/F Q3**

	answers	extra information	mark
(a)	sexual		1
	alleles		1
	recessive		1
	dominant		1
(b) (i)	B		1
(ii)	A		1
total			6

**3413/F Q4**

	answers	extra information	mark
(a)	asexual		1
	clone		1
(b) (i)	to reduce water loss/as it has no roots		1
(ii)	can obtain plant with desired features/like parent	accept example do <b>not</b> accept genetically identical – unqualified	1
	cheap/quick		1
total			5

3413/F Q5

	answers	extra information	mark
(a) (i)	yeast	answers must be in this order	1
(ii)	bacteria		1
(b) (i)	bacteria can grow/reproduce <u>quickly</u> <b>or</b> enzymes work quickly		1
(ii)	(lactic) acid produced		1
(iii)	mould/bacteria		1
(c)	any <b>four</b> from <ul style="list-style-type: none"> <li>• sterilise equipment/solid agar</li> <li>• sterilise culture medium before use</li> <li>• pass inoculating loop through flame</li> <li>• seal plates after inoculation</li> <li>• do not touch/breathe on agar</li> <li>• keep lid on agar as much as possible</li> </ul> accept any sensible precaution		4
total			9

**3413/F Q6**

	answers	extra information	mark
(a)	red blood cell	answers must be in this order	1
	plasma		1
	white blood cell		1
(b) (i)	transports oxygen		1
(ii)	any <b>one</b> from <ul style="list-style-type: none"> <li>• transports carbon dioxide</li> <li>• transports urea</li> <li>• transports products of digestion</li> </ul>	accept suitable named dissolved substance	1
total			5

**3413/F Q7**

	answers	extra information	mark
	Streamlined body shape	Provide large surface area to lift the bird up	1
	Bones containing air spaces	Light but give strength	1
	Large wings	Reduces air resistance	1
total			3

**3413/F Q8**

	answers	extra information	mark
(a)	carbon dioxide <b>and</b> water	allow correct formulae answers in either order	1
	sugar/glucose/starch <b>and</b> oxygen	answers in either order	1
(b)	B <del>    </del> No light and no chlorophyll		1
	C <del>    </del> Chlorophyll and no light		1
	D — Light but no chlorophyll		1
total			5

**3413/F Q9**

	answers	extra information	mark
(a)	(too) cold	accept converse	1
	for microbes		1
(b) (i)	<u>more</u> cattle/sheep/rice fields	accept landfill sites	1
(ii)	burning of fossil fuels/deforestation	more cars insufficient	1
(c)	acid rain <b>or</b> effect of acid rain		1
total			5



**3413/F Q10**

	answers	extra information	mark
(a)	$\frac{200}{1000} \times 100 = 20\%$	accept 20% with no working  if incorrect allow 1 mark for:- 200kJ available	2
(b)	any <b>two</b> from <ul style="list-style-type: none"> <li>• used in movement</li> <li>• some lost as heat</li> <li>• some cannot be digested/pass out in faeces/egested</li> <li>• used to repair cells</li> <li>• active transport</li> </ul>	accept lost in respiration/used to maintain body temperature excretion alone (neutral)	2
(c)	any <b>two</b> from <ul style="list-style-type: none"> <li>• controls ripening</li> <li>• prevents over ripening</li> <li>• herbicide</li> <li>• rooting powder</li> <li>• stimulate growth</li> </ul>	accept make plants bigger	2
total			6

**3413/F Q11**

	answers	extra information	mark
(a)	horse A provides nucleus/DNA/ genes/genetic information	accept converse e.g. no DNA from B	1
	link DNA/genes/genetic information with presence of nucleus		1
(b)	less (phenotypic) variation	do <b>not</b> accept they all look the same	1
	unable to adapt to different conditions/selective breeding difficult/ not possible	accept e.g. less chance that some might be resistant to a new disease accept inbreeding problems more likely	1
total			4

**3413/F Q12**

	answers	extra information	mark
(a)	causes mutation/change in genetic information/DNA		1
(b)	<p><b>Quality of written communication</b></p> <p>one mark for correct linking of ideas</p> <p>any <b>three</b> from</p> <ul style="list-style-type: none"> <li>• non-resistant forms die/only resistant forms survive when exposed to antibiotic</li> <li>• resistant forms breed</li> <li>• breeding more successful as there is little competition for resources</li> <li>• <u>R-gene</u> passed onto offspring</li> </ul>	<p>either survival → breed <b>or</b> breed → gene passed on</p>	<p>1</p> <p>3</p>
total			5

**3413/F Q13**

	answers	extra information	mark
(a)	97.5%	if incorrect allow 1 mark for:-  $1800 - 45 = \underline{1755}$  <b>or</b> $\frac{1755}{1800} \times 100$	2
(b) (i)	patients isolated so less risk of catching the disease		1
	anti-toxin used		1
(ii)	fewer people with the disease	<b>do not</b> accept no cases	1
	as (children) now vaccinated		1
	antibiotics used	accept other examples of improved treatment	1
total			7

**3413/F Q14**

	answers	extra information	mark
	any <b>five</b> from <u>Advantages:</u> <ul style="list-style-type: none"> <li>• no restrictions on diet</li> <li>• no need for regular treatment/regular hospital visits</li> <li>• a consequence e.g. can go on holiday</li> <li>• freed from discomfort of dialysis</li> </ul> <u>Disadvantages:</u> <ul style="list-style-type: none"> <li>• risk of rejection</li> <li>• risks of (major) operation</li> <li>• difficulty in finding (suitable) donor</li> <li>• risk of infection when on immunosuppressive drugs</li> </ul>	at least two advantages and two disadvantages  do <b>not</b> accept live a normal life (insufficient)  do <b>not</b> accept cost	5
total			5

**3413/F Q15**

	answers	extra information	mark
(a)	algae/plankton/microscopic organisms		1
(b) (i)	any <b>two</b> from <ul style="list-style-type: none"> <li>• gills/mucus trap starch grains</li> <li>• cilia involved</li> <li>• cilia beat to move the starch grains</li> </ul>	OWTTE accept suitable description of cilia e.g. hairs	2
(ii)	(cilia) beat more slowly  enzymes work more slowly/ respiration is slower/energy released more slowly		1  1
total			5

**3413/F Q16**

	answers	extra information	mark
(a)	increased rate of breathing		1
	increased depth of breathing		1
(b)	<u>more</u> oxygen		1
	needed for respiration/to release energy		1
(c)	24 (breaths/min)	if not correct allow 1 mark for:-  12 breaths in 30 secs  accept equivalent	2
total			6