



## General Certificate of Secondary Education

# Biology (Modular) 3413/F

## *Specification A*

# Mark Scheme

## *2006 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 2006**

**3413/F Q1**

	answers	extra information	mark
(a)	nitrogen oxide	either order	2
	carbon dioxide		
	pesticide	either order	2
	fertiliser		
(b)	less/no competition/fight for light/ water/ minerals/ space	accept more light more water more minerals more space do <b>not</b> accept weeds take <u>all</u> light, water, etc do <b>not</b> accept more food	2
total			6

**3413/F Q2**

	answers	extra information	mark
(a)	91-9-30=52 52	2 marks for correct answer without working	2
(b)	<b>either</b> broken down/decay/decompose by microbes/bacteria/fungi  <b>or</b> eaten by rabbit nutrients absorbed	accept used in growth/respiration	1 1
total			4

**3413/F Q3**

	answers	extra information	mark
(a) (i)	<b>B</b>		1
(ii)	ovary		1
(iii)	monthly		1
(iv)	hormones		1
(b) (i)	<b>R</b>		1
(ii)	DNA		1
total			6

**3413/F Q4**

	answers	extra information	mark
(a) (i)	$264/440 \times 100$ 60%	2 marks for correct answer without working	2
(ii)	camouflaged  so fewer eaten		1  1
(b)	any <b>two</b> from  <ul style="list-style-type: none"> <li>• more food available (as fewer yellow)</li> <li>• (more) reproduction of brown</li> <li>• <i>idea of offspring inherit brown shell allele</i></li> </ul>	accept converse	2
total			6

**3413/F Q5**

	answers	extra information	mark
(a)	antibody	a substance produced by white blood cells to destroy bacteria	1
	antibiotic	a microbe that causes disease	1
	antigen	a drug that kills bacteria inside the body	1
	pathogen	a protein found in a vaccine that stimulates the immune response	1
total			4

**3413/F Q6**

	answers	extra information	mark
(a)	cell wall		1
	nucleus		1
	cytoplasm		1
(b) (i)	sugar/protein	accept any suitable named nutrient do <b>not</b> accept food/O <sub>2</sub> /water	1
(ii)	kills/gets rid of microbes/ pathogens	answers must be in this order accept to sterilise it	1
	prevent microbes getting in		1
	prevent growth of (human) pathogens		1
	<b>Quality of written communication</b> 1 mark for correct use of 2 scientific terms eg sterilise/pathogen/contamination/ bacteria/microorganism/experiment		1
total			8

**3413/F Q7**

	answers	extra information	mark
(a) (i)	any <b>two</b> from <ul style="list-style-type: none"> <li>• used in chemical reactions</li> <li>• used in transport</li> <li>• cooling</li> <li>• (water) replaces that lost in sweating/to make sweat</li> </ul>	do <b>not</b> accept stops dehydration	2
(ii)	(sugar) used for energy in respiration/muscle contraction		1 1
(b) (i)	without oxygen		1
(ii)	oxidise/breakdown (using oxygen)		1
total			6

**3413/F Q8**

	answers	extra information	mark
(a)	label correct		1
(b)	sharp tip (to pierce skin) hollow (to suck blood)		1 1
(c)	saliva contains substance to stop clotting	accept injects their spit	1 1
total			5

**3413/F Q9**

	answers	extra information	mark
(a)	any <b>two</b> from <ul style="list-style-type: none"> <li>• area investigated</li> <li>• length of time spent collecting/same number collecting</li> <li>• same part of beach studied</li> <li>• same day/same week/month</li> <li>• same conditions/weather</li> </ul>		2
(b) (i)	any <b>two</b> from <ul style="list-style-type: none"> <li>• fewer crabs/no crabs</li> <li>• more mussels</li> <li>• more barnacles</li> </ul>	'more seaweed' is insufficient	2
(ii)	any <b>one</b> from <ul style="list-style-type: none"> <li>• only one pair of beaches studied</li> <li>• wind conditions may change</li> </ul>	accept other valid answers	1
total			5



**3413/F Q10**

	answers	extra information	mark
(a)	reduces water loss	do <b>not</b> accept ‘there is no water loss’	1
(b)	reduces heat loss <u>at night</u> /accept keeps them warm at night	accept reduces water loss if not given in (a)	1
	reduces heat gain <u>in day</u> /keeps them cool in day	accept keeps camel insulated if neither marking point given ignore reference to protection from u/v	1
(c)	(light brown fur) for camouflage/blend in	accept more heat reflected	1
	(wide feet) prevent sinking		1
total			5

**3413/F Q11**

	answers	extra information	mark
(a)	buried/or suitable description	do <b>not</b> accept buried with rock	1
	slow decay/no decay		1
	replaced by minerals/other materials	accept petrified/turned to rock/stone	1
	<b>Quality of written communication</b> 1 mark for correct sequencing		1
(b)	any <b>three</b> from <ul style="list-style-type: none"> <li>• change in environment/climate/habitat/weather/surroundings</li> <li>• new predators/different predator</li> <li>• new competitor/different competitor</li> <li>• new disease/different disease</li> <li>• no prey to eat/prey becomes extinct/no food to eat</li> </ul>		3
total			7

**3413/F Q12**

	answers	extra information	mark
(a)	choose parents with named feature from diagram (eg large fruit/more fruit)		1
	breed together/idea of sexual reproduction		1
	choose 'best' offspring and breed		1
(b)	to obtain (genetically) identical copies/clones/same genes passed on/quicker		1
total			4

**3413/F Q13**

	answers	extra information	mark
(a)	urea	accept other valid answers	1
(b)	dialysis fluid used/or described	do <b>not</b> accept diffusion by osmosis	1
	separated from blood by membrane		1
	diffusion (from blood to fluid)		1
(c)	any <b>two</b> from <ul style="list-style-type: none"> <li>• no (compatible) kidney available/long waiting list</li> <li>• not strong enough for operation/risks of major surgery/operation</li> <li>• may be short term kidney failure</li> </ul>	do <b>not</b> accept costs	2
total			6

**3413/F Q14**

	answers	extra information	mark
(a) (i)	bubbles/froth/foam		1
(ii)	boiling kills cells /yeast		1
	only living yeast cells carry out fermentation	accept so therefore there is no fermentation ( <b>if the yeast cells are dead</b> )	1
(iii)	sugars used (by yeast)		1
	CO <sub>2</sub> produced/ethanol/alcohol		1
(b) (i)	(contains) <b>bacteria</b>		1
(ii)	cheese/yoghurt	accept other valid answers	1
total			7

**3413/F Q15**

	answers	extra information	mark
(a)	suitable linear scale	minimum of 5 small squares for 1pH minimum of 5 small squares for 10 minutes	1
	all points correctly plotted	½ small square tolerance	1
	line of best fit which does not start before 4		1
(b)	pH7/correct for the graph		1
(c)	(to produce)	accept converse points	
	small molecules/broken down		1
	soluble		1
	so can be absorbed (in small intestine)/so it can enter the blood		1
total			7

**3413/F Q16**

	answers	extra information	mark
(a)	1.7 (arbitrary units)	accept 63%	1
(b)	increased temperature/(added) heat from the stove/hotter		1
	more carbon dioxide/CO <sub>2</sub> made by the stove		1
(c)	temp/CO <sub>2</sub> no longer limiting/light intensity limiting/not enough light available (in March)		1
total			4