OCR
RECOGNISING ACHIEVEMENT

GCE

Biology

Advanced Subsidiary GCE

Unit **F212:** Molecules, Biodiversity, Food and Health

Mark Scheme for June 2013

Oxford Cambridge and RSA Examinations

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All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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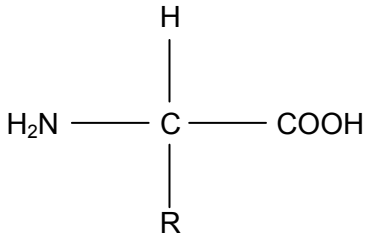
Annotations

Annotation	Meaning
	Correct answer
	Incorrect response
	Benefit of Doubt
	Not Benefit of Doubt
	Error Carried Forward
	Given mark
	Underline (for ambiguous/contradictory wording)
	Omission mark
	Ignore
	Correct response (for a QWC question)
	QWC* mark awarded
CON	a correct response is associated with a piece of clearly incorrect science within the same statement and award no mark

Quality of Written Communication

Subject-specific Marking Instructions

- For questions in which the command word is 'suggest' ignore incorrect responses and credit a correct response wherever it occurs
- Accept phonetic spellings unless otherwise indicated
- All marks are stand-alone unless otherwise stated in Additional Guidance
- For 'idea of' marking points a wide range of wording is acceptable. The mark is to be awarded for the idea.

Question			Answer	Marks	Guidance
1	(a)	(i)	<u>primary structure</u> ;	1	**ACCEPT** 1^{o} structure **IGNORE** polypeptide
1	(a)	(ii)	NH_2 at one end ; COOH at opposite end ; C in centre (of a single amino acid) bonded (separately) to one R and one H ;	3	If R group not shown as '**R**' then award **max 2** (as general structure asked for in Q) **IGNORE** labels **ACCEPT** displayed structure of NH_2 / HNH **ACCEPT** displayed structure of COOH if correct double bond shown **AWARD** only if the candidate has drawn a single 'amino acid' molecule 
1	(b)	(i)	strength / toughness / insolubility ;	1	**Mark the first answer.** If the answer is correct and an additional answer is given that is incorrect or contradicts the correct answer then = **0 marks** **ACCEPT** strong / tough **IGNORE** flexible / inelastic **IGNORE** withstand pressure

Question			Answer		Marks	Guidance
1	(b)	(ii)			6	One molecule of collagen is 3 polypeptide chains twisted around each other. **CREDIT** annotated diagrams unless contradicted by text
			1	peptide bonds , between amino acids / in polypeptide **;**		
			2	every 3rd amino acids is , same / glycine **;**		**2 ACCEPT** high proportion of / 35% , glycine / same amino acid
			3	coil / twist / spiral / helix **;**		**3 CREDIT** in context of single polypeptide or 3 polypeptides **but DO NOT CREDIT 'α**-helix' in the context of a single polypeptide **3 IGNORE** wound
			4	left-handed (helix) **;**		**4 'α**-helix, which is left handed' – **AWARD** mp4 but **DO NOT CREDIT** mp3
			5	glycine / small R group **,** allows closeness / twisting (of polypeptide chains) **;**		
			6	three polypeptide chains **;**		
			7	hydrogen / H , bonds between (polypeptide) chains **;**		**7** Must be in correct context **7 DO NOT CREDIT** H^+ / H_2 bonds
			8	no / few, hydrophilic (R) groups on outside (of molecule) **;**		
			9	(adjacent molecules joined by) crosslinks **;**		**9 ACCEPT** covalent bonds between adjacent molecules **9 DO NOT CREDIT** in context of bonding between 3 polypeptides **9 IGNORE** disulfide
			10	crosslinks / ends of molecules , being staggered **;**		
			11	fibril **;**		**11 IGNORE** micro

Question			Answer		Marks	Guidance
1	(c)	(i)	transport / AW , of, oxygen / O_2 **;**		1	**Mark the first answer.** If the answer is correct and an additional answer is given that is incorrect or contradicts the correct answer then = **0 marks** **ACCEPT** buffering blood / carrying CO_2 / storing oxygen **IGNORE** binding oxygen **IGNORE** Iron
1	(c)	(ii)		*haemoglobin (has / is):*	3	**IGNORE** prompt lines – mark as prose but max 2 if an incorrect statement about haemoglobin is given **IGNORE** statements about collagen even if incorrect, answers must refer to haemoglobin
			1	globular **;**		**1 IGNORE** not fibrous / ball shaped
			2	hydrophobic (R) groups on inside / hydrophilic (R) groups on outside **;**		
			3	4 **,** chains / sub-units / polypeptides **;**		**3 IGNORE** strands / molecules / proteins **4 ACCEPT** in haemoglobin the subunits are not all the same
			4	*idea that* subunits are (two) different types **;**		**3&4** "two alpha and two beta chains" = 2 marks (mp 3 and 4)
			5	α / alpha , helix **;**		**5 ACCEPT** a-helix
			6	*idea that* proportion of glycine similar to that , of other amino acids / in other proteins **;**		**6 ACCEPT** wide(r) range of amino acids **IGNORE** refs to Fe (as part of prosthetic group)
				Total	**15**	

Question			Answer		Marks	Guidance
2	(a)		enzymes **;**		1	**IGNORE** protein / catalysts **ACCEPT** enzymic
2	(b)	(i)	**1**	similar, shape / structure **;**	3	**1 IGNORE** same shape **1 ACCEPT** 'ethanol same shape as part of DEG'
			2	example of similarity **;**		**2 IGNORE** they contain C, H and O **2 IGNORE** the end is the same **2 ACCEPT** e.g. they both have OH **2 ACCEPT** similar parts identified on diagram if they are clearly indicating an example of similarity
			3	both , will fit into / complementary (shape) to / bind to / bond to , <u>active site</u> (of alcohol dehydrogenase) **;**		**3 ACCEPT** implication of both **3 IGNORE** attach / enter **3 IGNORE** both will form ESC (with alcohol dehydrogenase)
2	(b)	(ii)	**1**	(ethanol) <u>compete</u>s with DEG **; ora**	3	**1 ACCEPT** ethanol / DEG , is , a <u>competitive</u> inhibitor
			2	(when at high(er) concentration) ethanol more likely to , collide with / bind to / bond to , active site **; ora**		**2 ACCEPT** 'ethanol more likely to form ESC' **2 ACCEPT** implication of 'more likely' from context **2 IGNORE** attach / enter
			3	less , DEG breakdown / toxic product **; ora**		**3 ACCEPT** DEG product is diluted **3 ACCEPT** no DEG breakdown **IGNORE** 'you will drink less of it'
				Total	**7**	

Question			Answer		Marks	Guidance
3	(a)	(i)	**B** and **C** ;		1	Both need to be given for the mark to be awarded. **DO NOT CREDIT** if **A** also given.
3	(a)	(ii)	(involved) after , pathogen / AW , has entered the body ;		1	**IGNORE** ref to primary defence without the clear idea that the pathogen has entered the body **IGNORE** refs to mechanisms of action, e.g. 'phagocytes do not make antibodies' **ACCEPT** attacking foreign bodies after they have passed through the skin
3	(a)	(iii)	(phagocytes) able to, digest / break down / engulf / target / deal with, a range of / many different , pathogens ; **ora**		1	**ACCEPT** bacteria or virus as synonym for pathogen if the idea of a variety is clearly present **ACCEPT** phagocytes can break down *any* pathogen **ACCEPT** phagocytes do not have (antigen-)specific receptors **IGNORE** phagocytes do not make memory cells **IGNORE** antigen if used as synonym for pathogen
3	(a)	(iv)	**1**	lobed / narrow , nucleus ;	2	
			2	(cells) can change shape ;		**2 ACCEPT** in context of cell or nucleus **2 ACCEPT** cells , are plastic / have flexible structure / have flexible membrane **2 IGNORE** squashable / stretch
			3	can squeeze / move / fit / AW , between cells / through pores , in (walls of) capillaries ;		**3 ACCEPT** holes / gaps / fenestrations
			4	histamine makes , capillary walls / endothelium , leaky ;		

Question			Answer		Marks	Guidance
3	(a)	(v)			6	**ACCEPT** phonetic spellings throughout
			1	(pathogen) engulfed / enveloped / surrounded by cytoplasm (from phagocyte) **;**		**1 ACCEPT** 'pseudopodia / cytoplasm / cell membrane , extend from phagocyte' **1 DO NOT CREDIT** eaten. **ACCEPT** ingested
			2	endocytosis / phagocytosis **;**		
			3	(formation of) phagosome / phagocytic vacuole / phagocytic vesicle **;**		**3 CREDIT** in correct context only
			4	(phago) lysosomes **;**		
			5	(lysosomes / phagosome) move towards / fuse with (each other) **;**		**5 ACCEPT** attracted to / joins
			6	(named) enzyme(s) / lysins / hydrogen peroxide / free radicals (in lysosomes) **;**		
			7	(pathogen) digested / broken down / hydrolysed **;**		**7 IGNORE** destroyed / broken up / killed
			8	(to) amino acid / sugar / glucose / fatty acid / glycerol **;**		
			9	(break down products) absorbed / AW (into cytoplasm) **or** unwanted products removed (by exocytosis) **;**		**9 IGNORE** refs to antigen presentation **9 ACCEPT** enter cytoplasm
			10	cytoskeleton involved in (endocytosis / movement of vesicles) **;**		
			QWC key points in sequence **;**		1	**Award** if the following mark points have been awarded: **mp 1 or 2** followed by **mp 6 or 7**

Question			Answer	Marks	Guidance
3	(b)	(i)	*Mycobacterium* /*M. tuberculosis* / *M. bovis* ;	1	**ACCEPT** phonetic spellings **IGNORE** case of initial letter No need to underline
3	(b)	(ii)	droplets (containing pathogen) ; (released by) coughing / sneezing ; inhaled by (uninfected) , individual / AW ;	2	**IGNORE** airborne **IGNORE** laughing / talking / kissing / breathed out

Question			Answer		Marks	Guidance
3	(c)	(i)			3	**Mark points 1-5 cannot be inferred from figures**
			1	in both years incidence (of TB) , decreases / AW , as income , increases / AW **; ora**		**1 ACCEPT** 'incidence is higher in low income group and lower in high income group, in both years / always'
			2	no change in, low / lower middle, (income groups) **;**		
			3	increase in upper middle (income group) **;**		**3 ACCEPT** upper middle less in 2000
			4	decrease in high (income group) **;**		**4 ACCEPT** high (group) more in 2000
			5	*idea of* overall very little change between 2000 and 2008 **;**		
			6	calculated difference in figures with units to support points 3 to 5 **;**		**6 ACCEPT** any increase or decrease e.g., high group has gone down by 3 per 100000 **6 ACCEPT** also • 10% increase in upper middle group • 17.6% / 18% , decrease in high income group • 1% / 1.3% , increase overall • high income group in 2008 is , 82.4% / 82% / 0.824 / 0.82 , of original value **6 IGNORE** 0% increase in low / lower middle income groups There is no need to refer to years as only 2 are shown

Question			Answer		Marks	Guidance
3	(c)	(ii)			3	**IGNORE** prompt lines and mark as prose
			1	overcrowded / AW (living space) **;**		**1 ACCEPT** cramped
			2	poorly ventilated (living space) **;**		
			3	poor diet / malnourished **;**		
			4	poor health **;**		**4 ACCEPT** poor immune system **4 IGNORE** hygiene / standard of living
			5	homelessness **;**		
			6	*idea that* more likely to consume , meat / milk, from infected cattle **;**		
			7	*idea of* vaccination / medical treatment , more difficult to access **;**		**7 CREDIT** healthcare more expensive **7 ACCEPT** poor healthcare **7 IGNORE** less aware of the risks
				Total	**21**	

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>4</td><td>(a)</td><td>(i)</td><td>
<table>
<tr><th>species</th><th>number of individuals (n)</th><th>n/N</th><th>$(n/N)^2$</th></tr>
<tr><td>Dog's mercury</td><td>40</td><td>0.40</td><td>0.1600</td></tr>
<tr><td>Wild strawberry</td><td>13</td><td>0.13</td><td>0.0169</td></tr>
<tr><td>Common avens</td><td>43</td><td>0.43</td><td>0.1849</td></tr>
<tr><td>Wood sorrel</td><td>4</td><td>0.04</td><td>0.0016</td></tr>
<tr><td></td><td>N = 100</td><td></td><td>$\Sigma(n/N)^2$ = 0.3634</td></tr>
<tr><td></td><td></td><td></td><td>$1-(\Sigma(n/N)^2)$ = 0.6366</td></tr>
</table>
; ; ;</td><td>3</td><td>Award 3 marks for the correct answer (0.6366)

If answer is incorrect:

IGNORE numbers in first 4 rows

'N = 100' = 1 mark

$\Sigma(n/N)^2$
ALLOW ecf for correct calculation from candidate's incorrect N value

$1-(\Sigma(n/N)^2)$
ALLOW ecf for correct calculation from candidate's $\Sigma(n/N)^2$ value

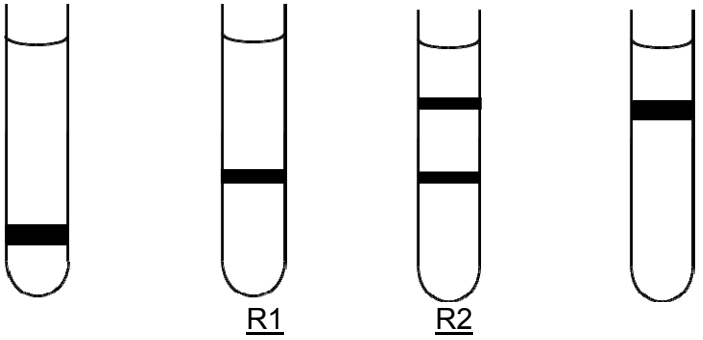
Answer must be given to 4 dp for ecf</td></tr>
<tr><td>4</td><td>(a)</td><td>(ii)</td><td>species richness
number of species (in an area / habitat) ;

species evenness
number of / how many, individuals there are of, each / every, species (in an area / habitat) ;</td><td>2</td><td>IGNORE organisms / abundance / quantity / variety
DO NOT CREDIT amount

ACCEPT 'organisms' as AW for individuals
CREDIT relative abundance of (each) species / population size of each species
IGNORE relative abundance of, a / one, species
DO NOT CREDIT amount</td></tr>
</table>

Question			Answer		Marks	Guidance
4	(a)	(iii)	(habitat) dominated by, one / few / AW, species **;** change in one species , likely to affect whole habitat / AW **;** community / ecosystem / habitat / area , is unstable / not able to withstand change / easily damaged **;**		2	**ACCEPT** high number of one species **IGNORE** environment / biodiversity as AW for community **IGNORE** the community / AW will be damaged
4	(b)		**1** *idea of* random sampling **;** **2** standardisation of technique **;** **3** use of, key/identification chart **;** **4** survey at different , times of year / season **;** **5** include , trees / species larger than quadrat **;**		2	**IGNORE** prompt lines and mark as prose **1 ACCEPT** description of randomisation method **2 ACCEPT** description of standardisation method **2 ACCEPT** count the same way each time **4 IGNORE** 'repeat' unqualified **4 IGNORE** different times of day / different times
			Total		**9**	

Question			Answer	Marks	Guidance
5	(a)	(i)	**X** cytosine / pyrimidine **;** **Y** nucleotide **;**	2	**Mark the first answer on each prompt line.** If the answer is correct and an additional answer is given that is incorrect or contradicts the correct answer then = **0 marks** **X ACCEPT** nitrogenous base / organic base **X IGNORE** C
5	(a)	(ii)	at least one line between all opposite bases **;** two lines between A and T **and** three lines between both instances of C and G **;**	2	**IGNORE** bond labels / H / O / δ^+ / δ^- Bases on left strand do not need to be labelled but **CON** this mark if incorrectly labelled
5	(a)	(iii)	polypeptide **;** ribosome **;**	2	**ACCEPT** protein
5	(a)	(iv)	(usually) single stranded / would not have 2 strands **;** uracil / U, instead of thymine / T **;**	2	**Mark the first answer on each prompt line.** If the answer is correct and an additional answer is given that is incorrect or contradicts the correct answer then = **0 marks** **IGNORE** shorter **ACCEPT** only one backbone **DO NOT CREDIT** incorrect spelling of thymine with 'a' **IGNORE** difference in sugar as on the diagram ribose and deoxyribose would appear the same
5	(b)	(i)	one strand, from original DNA **and** one strand newly formed **;** an , (original) strand / polynucleotide , acts as template (for new strand) **;**	2	**ACCEPT** one old and one new strand **ACCEPT** each strand is copied

Question			Answer	Marks	Guidance
5	(b)	(ii)	(DNA) can be replicated without error **/** same sequence of nucleotides is produced **;** reduces occurrence of mutation **;** allows (re-)formation of , hydrogen / H , bonds **;**	2	**ACCEPT** formation of identical DNA **ACCEPT** same / correct , order / sequence , of bases This mark point is for the correct use of the term 'mutation' and does not imply without error. **ACCEPT** prevents mutation **DO NOT CREDIT** H^+ / H_2 bonds
5	(c)	(i)	horizontal band drawn in tube R1 clearly higher than band in ^{15}N tube and clearly lower than band in ^{14}N tube **;**	1	**DO NOT CREDIT** if more than one band drawn **IGNORE** thickness of bands and whether bands are shaded **DO NOT CREDIT** if there is any overlap with a band in another tube  **DO NOT CREDIT** if more than two bands drawn **IGNORE** thickness of bands and whether bands are shaded
5	(c)	(ii)	one band (in R2) clearly at the same height as that in tube R1 **and** one band (in R2) clearly at the same height as that in the ^{14}N tube **;**	1	

Question			Answer	Marks	Guidance
5	(d)			3	**IGNORE** prompt lines - mark as prose I**GNORE** amount throughout
			same concentration of sugar (solution in each tube) **;** same volume of, mixture / solution / sugar solution (in each tube) **;**		**IGNORE** mass **IGNORE** mass **IGNORE** volume , of sugar / DNA extract
			spin (all tubes) at same , speed / acceleration **;** spin (all tubes) for same (length of) time **;**		**ACCEPT** tubes spun at constant speed **IGNORE** temperature / pH **IGNORE** mass of DNA
			Total	**17**	

Question			Answer		Marks	Guidance
6	(a)	(i)	range / variety / number **,** of species (in an area) **;** range / variety of, habitats / ecosystems **;** variety of , alleles / genes **;**		2	**IGNORE** amount throughout **ACCEPT** a combination of species richness and species evenness **ACCEPT** abundance **IGNORE** organisms **ACCEPT** number of habitats
6	(a)	(ii)	**1**	part of (local) food , chain / web **;**	2	**IGNORE** prompt lines and any reference to biodiversity **CREDIT** a correct response anywhere in the answer **IGNORE** unspecified refs to ethical, aesthetic or economic **1 ACCEPT** keystone species
			2	tourism **;**		
			3	native species / *idea of* heritage of the area **;**		**3 ACCEPT** native to UK
			4	to protect a neighbouring red squirrel population **;**		
			5	*idea that* Northumberland red squirrel population is nationally significant **;**		**5** e.g. Northumberland has significant proportion of total population so loss of this population might jeopardise all British squirrels **IGNORE** refs to genetic resource as no suggestion that this population is distinct from red squirrels elsewhere.

Question			Answer	Marks	Guidance
6	(a)	(iii)	*idea that:* it is wrong to interfere with nature **;** it is wrong to kill animals **;** grey has (as much) right to live there (as red) **;** *idea that* might be useful in the future / enjoyed by future generations **;** grey will be part of food chain **;**	1	**ACCEPT** qualified refs to , moral / ethical / religious , reasons **IGNORE** it's wrong to play God **ACCEPT** it is cruel
6	(b)		*idea that*: **1** harder to see **; ora** **2** (harder to see because) more timid / frightened of people / spend less time on ground / smaller **; ora** **3** species may be wrongly identified **;** **4** grey squirrels more likely to visit gardens / parks / public areas **; ora** **5** people are more inclined to report grey sightings **; ora** **6** AVP **: ora**	2	**IGNORE** prompt lines and mark as prose **CREDIT** correct response where seen **1 ACCEPT** 'they remain hidden'. **IGNORE** 'they may be hiding' **2 IGNORE** 'they may be hiding' **6 ACCEPT** grey squirrels might be less camouflaged (so easier to see) **6 ACCEPT** red squirrels might be (more) nocturnal / AW **6 IGNORE** squirrel species hard to distinguish / same individual counted more than once

Question			Answer		Marks	Guidance
6	(c)				3	**IGNORE** prompt lines and mark as prose **IGNORE** refs to benefits of development Answers should be given in terms of assessing aspects of the development.
			1	size (of development) **;**		**1 ACCEPT** 'how big will it be?'
			2	*idea of* environmental sensitivity / which species present / which habitats present , in the area **;**		**2 ACCEPT** e.g. 'what lives there?' / 'whether a rare species live there' 'whether red squirrels live there' / 'the biodiversity of the area' / is it an SSSI? / species richness
			3	potential damage (to area / organisms) **;**		**3 ACCEPT** e.g. 'how much damage will it do?' / effect on ecosystem / how much it would be destroyed / how many organisms will it kill?
			4	*idea of* potential strategies to minimise impact **;**		**4 ACCEPT** e.g. 'what can be done about it?' / possible change to reduce impact **4** Must be a general statement **4 IGNORE** stated example without the general idea
				Total	**10**	

Question			Answer		Marks	Guidance
7	(a)	(i)	*idea of* if one susceptible to, this / the disease, all likely to be **;**		1	**DO NOT CREDIT** if the response is referring to diseases in general
7	(a)	(ii)	**1**	environment / environmental factor **;**	2	
			2	(variation in) weather conditions / temperature **;**		**2 ACCEPT** climate
			3	rainfall / soil water content **;**		**3 IGNORE** 'availability of water' unqualified
			4	soil , (named) mineral / nitrate , content / AW **;**		**4 IGNORE** nutrient **4 ACCEPT** mineral availability / amount of fertiliser added
			5	(named) biotic factor (might vary) **;**		**5** e.g. number of pests / competition from other plants / disease
7	(a)	(iii)	mutation **;**		1	**ACCEPT** deletion etc. **IGNORE** (named) mutagenic agent

Question			Answer		Marks	Guidance
7	(b)				6	If a candidate describes resistance as immunity **DO NOT CREDIT** the first time it is seen but apply **ECF** thereafter
			1	cross / breed, with disease resistant variety **;**		**1 ACCEPT** make two disease resistant individuals reproduce **1 IGNORE** crossbreed two best individuals
			2	method to test offspring for disease resistance **;**		**2 ACCEPT** general statement **or** example e.g: 'germinate seeds, expose to disease, see if die'
			3	select , best offspring / offspring with resistance **;**		**3 ACCEPT** seeds / tubers / potatoes **3 IGNORE** children / babies
			4	(inter)breed, offspring with resistance / best offspring **;**		
			5	(continue process) for (many) generations **;**		**5 IGNORE** many years
			6	*idea of* avoid breeding**,** closely related / AW , individuals to preserve genetic diversity **; ora**		**6 ACCEPT** avoid , inbreeding / inline breeding **6 ACCEPT** 'maintain genetic diversity by breeding with plants from different field / area' **6 ACCEPT** breed with different varieties to widen the gene pool
			7	(regularly back) cross with, wild variety **;**		
			8	*idea of* preserving rare varieties in case they are needed in the future **;**		**8 ACCEPT** use of seed bank to preserve range of alleles
			9	AVP **;**		**9** e.g, ref. to marker assisted selection / detail of pollination method / prevention of self-pollination / asexual reproduction of desired variety
			QWC ;		1	**Award** if the answer has been given **one** mark from marking points **1–5 and one** mark from marking points **6–8**
				Total	**11**	

Question			Answer		Marks	Guidance
8	(a)				5	**Mark the first answer on each prompt line.** If the answer is correct and an additional answer is given that is incorrect or contradicts the correct answer then = **0 marks** **ACCEPT** phonetic spellings
			1	*Echiniscus* ;		**1** Initial letter must be upper case
			2	order ;		**2 ACCEPT** super family / epifamily
			3	phylum ;		
			4	Animalia ;		**4 ACCEPT** animals **4 IGNORE** case of initial letter
			5	Eukaryota ;		**5 ACCEPT** eukaryotes / Eukarya / eukaryotic **5 IGNORE** case of initial letter
8	(b)		**1**	(phylogeny is) evolutionary relationships (between organisms) ;	3	**1 IGNORE** 'evolution' without further qualification **1&2** phylogeny is the closeness of evolutionary relationships = 2 **marks** **1 ACCEPT** phylogeny is evolutionary history
			2	(phylogeny is study of) closeness of (evolutionary) relationships ;		
			3	phylogeny is basis of / used in , natural / scientific / modern, classification ;		**3 ACCEPT** new **3 IGNORE** related to classification
			4	*idea that* the closer the (evolutionary or genetic) relationship the closer the (taxonomic) grouping ;		**4 ACCEPT** ref to **recent** common ancestors as AW for close relationship **4 ACCEPT** named taxonomic group for 'grouping' **4 ACCEPT** 'if the DNA is very different then the group is not the same'
			5	correct use of example ;		**5** e.g. gorillas and chimpanzees (closely grouped)

Question			Answer	Marks	Guidance
8	(c)		too small to see **;** (unable to see them) until invention of microscope / development of suitable viewing apparatus / AW **;** only 0.3mm in length **;**	2	'can only be seen under microscope' **= 1 mark (mp1)** **IGNORE** 'can't see it' without the idea of size, e.g. can't see it clearly = **0 marks**, can't see its features = **0 marks** **ACCEPT** implication of being too small to see, e.g. 'you need a microscope to see them' **= mp1** 'people couldn't see them in the past because we didn't have microscopes' **= 2marks (mp1 and mp2)** **IGNORE** type of microscope if stated **ACCEPT '**magnifying glass' **ACCEPT** ± 0.1 mm
			Total	**10**	

Mark Scheme Conventions

The following conventions appear in the Mark Scheme

1. Bracketed words. The words in brackets are there to 'set the scene' and indicate the context in which the answer is expected. They do not need to appear. Award the mark as long as the statement in the brackets is not contradicted.

2. Solidus /. A solidus indicates alternative ways that a mark might be gained for a given Mark Point.

3. Use of the comma in a mark point. This indicates that some information from either side of the comma or commas is needed. It is used in conjunction with the solidus.

   In some cases the Guidance column may indicate examples of wording or terms that are acceptable (ACCEPT) or that should be ignored (IGNORE). In the case of IGNORE read on to see if something creditworthy appears later in the response.

4. Underlining.

   - solid underline. The word or part of word underlined is required but minor mis-spellings are acceptable as long as the word is phonetically the same
   - wavy underline. This indicates that whilst the word underlined is not precisely needed, alternative responses need to be closely related in meaning or be a clear description.

5. *idea of.* This is used as a prefix to marking points where there may be a fairly wide range of responses which cover the essence of the required response. This often requires examiner judgement. These often, but not exclusively, appear in questions such as those related to environmental or health issues.

6. ORA: 'or reverse argument' In cases where candidates could be credited for having described a process from the opposite point of view, ora is sometimes used on a mark scheme to save space. For example, in question 6(b) the question could be answered from the point of view of why red squirrels are hard to see or why grey squirrels are easy to see.

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