Oxford Cambridge and RSA

A Level Biology A

H420/01 Biological Processes

MARK SCHEME

Duration: 2 hours 15 minutes

MAXIMUM MARK 100

This document consists of 26 pages

MARKING INSTRUCTIONS

PREPARATION FOR MARKING

SCORIS

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *scoris assessor Online Training*; *OCR Essential Guide to Marking*.

2. Make sure that you have read and understood the mark scheme and the question paper for this unit. These are posted on the RM Cambridge Assessment Support Portal http://www.rm.com/support/ca

3. Log-in to scoris and mark the **required number** of practice responses ("scripts") and the **required number** of standardisation responses.

   YOU MUST MARK 10 PRACTICE AND 10 STANDARDISATION RESPONSES BEFORE YOU CAN BE APPROVED TO MARK LIVE SCRIPTS.

MARKING

1. Mark strictly to the mark scheme.

2. Marks awarded must relate directly to the marking criteria.

3. The schedule of dates is very important. It is essential that you meet the scoris 50% and 100% (traditional 50% Batch 1 and 100% Batch 2) deadlines. If you experience problems, you must contact your Team Leader (Supervisor) without delay.

4. If you are in any doubt about applying the mark scheme, consult your Team Leader by telephone, email or via the scoris messaging system.

5. **Crossed Out Responses**

Where a candidate has crossed out a response and provided a clear alternative then the crossed out response is not marked. Where no alternative response has been provided, examiners may give candidates the benefit of the doubt and mark the crossed out response where legible.

Rubric Error Responses – Optional Questions
Where candidates have a choice of question across a whole paper or a whole section and have provided more answers than required, then all responses are marked and the highest mark allowable within the rubric is given. Enter a mark for each question answered into RM assessor, which will select the highest mark from those awarded. *(The underlying assumption is that the candidate has penalised themselves by attempting more questions than necessary in the time allowed.)*

Multiple Choice Question Responses
When a multiple choice question has only a single, correct response and a candidate provides two responses (even if one of these responses is correct), then no mark should be awarded (as it is not possible to determine which was the first response selected by the candidate).
When a question requires candidates to select more than one option/multiple options, then local marking arrangements need to ensure consistency of approach.

Contradictory Responses
When a candidate provides contradictory responses, then no mark should be awarded, even if one of the answers is correct.

Short Answer Questions (requiring only a list by way of a response, usually worth only **one mark per response**)
Where candidates are required to provide a set number of short answer responses then only the set number of responses should be marked. The response space should be marked from left to right on each line and then line by line until the required number of responses have been considered. The remaining responses should not then be marked. Examiners will have to apply judgement as to whether a 'second response' on a line is a development of the 'first response', rather than a separate, discrete response. *(The underlying assumption is that the candidate is attempting to hedge their bets and therefore getting undue benefit rather than engaging with the question and giving the most relevant/correct responses.)*

Short Answer Questions (requiring a more developed response, worth **two or more marks**)
If the candidates are required to provide a description of, say, three items or factors and four items or factors are provided, then mark on a similar basis – that is downwards (as it is unlikely in this situation that a candidate will provide more than one response in each section of the response space.)

Longer Answer Questions (requiring a developed response)
Where candidates have provided two (or more) responses to a medium or high tariff question which only required a single (developed) response and not crossed out the first response, then only the first response should be marked. Examiners will need to apply professional

judgement as to whether the second (or a subsequent) response is a 'new start' or simply a poorly expressed continuation of the first response.

6. Always check the pages (and additional objects if present) at the end of the response in case any answers have been continued there. If the candidate has continued an answer there then add a tick to confirm that the work has been seen.

7. Award No Response (NR) if:

    - there is nothing written in the answer space

    Award Zero '0' if:

    - anything is written in the answer space and is not worthy of credit (this includes text and symbols).

    Team Leaders must confirm the correct use of the NR button with their markers before live marking commences and should check this when reviewing scripts.

8. The scoris **comments box** is used by your Team Leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**

    If you have any questions or comments for your Team Leader, use the phone, the Scoris messaging system, or email.

9. Assistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.

10. For answers marked by levels of response:

Read through the whole answer from start to finish, concentrating on features that make it a stronger or weaker answer using the indicative scientific content as guidance. The indicative scientific content indicates the expected parameters for candidates' answers, but be prepared to recognise and credit unexpected approaches where they show relevance.

Using a 'best-fit' approach based on the science content of the answer, first decide which set of level descriptors, Level 1, Level 2 or Level 3, **best** describes the overall quality of the answer using the guidelines described in the level descriptors in the mark scheme.

Once the level is located, award the higher or lower mark.

The higher mark should be awarded where the level descriptor has been evidenced and all aspects of the communication statement (in italics) have been met.

The lower mark should be awarded where the level descriptor has been evidenced but aspects of the communication statement (in italics) are missing.

In summary:

- **The science content determines the level.**
- **The communication statement determines the mark within a level.**

Level of response questions on this paper are **18(a)** and **19(c)**.

11. **Annotations**

Annotation	Meaning
DO NOT ALLOW	Answers which are not worthy of credit
IGNORE	Statements which are irrelevant
ALLOW	Answers that can be accepted
( )	Words which are not essential to gain credit
__	Underlined words must be present in answer to score a mark
ECF	Error carried forward
AW	Alternative wording
ORA	Or reverse argument

12. **Subject-specific Marking Instructions**

INTRODUCTION

Your first task as an Examiner is to become thoroughly familiar with the material on which the examination depends. This material includes:

- the specification, especially the assessment objectives
- the question paper
- the mark scheme.

You should ensure that you have copies of these materials.

You should ensure also that you are familiar with the administrative procedures related to the marking process. These are set out in the OCR booklet **Instructions for Examiners**. If you are examining for the first time, please read carefully **Appendix 5 Introduction to Script Marking: Notes for New Examiners**.

Please ask for help or guidance whenever you need it. Your first point of contact is your Team Leader.

Section A

Question			Answer	Marks	Guidance
1			A ✓	1	
2			B ✓	1	
3			A ✓	1	
4			D ✓	1	**ALLOW** A
5			B ✓	1	
6			D ✓	1	
7			B ✓	1	
8			C ✓	1	
9			C ✓	1	
10			C ✓	1	
11			D ✓	1	
12			C ✓	1	
13			D ✓	1	
14			C ✓	1	
15			C ✓	1	
			Total	**15**	

Section B

Question			Answer	Marks	Guidance
16	(a)	(i)	(Type) 2 / II / two ✓ *explanation:* insulin is (still) produced ✓ beta / β , cells still working ✓ *idea that* (liver) cells no longer respond to insulin ✓ fewer / damaged , (insulin) receptors ✓ if it was Type I then the woman would not produce (normal levels of) insulin ✓	**2 max**	**ALLOW** it is diabetes mellitus not diabetes insipidus **ALLOW** late onset **1 mark max** for explanation **DO NOT ALLOW** B / b , cells **ALLOW** (develop) insulin resistance **ALLOW** (insulin) receptors not working
		(ii)	low , carbohydrate / sugar , diet ✓ exercise ✓ manage weight (gain) ✓ drugs to control glucose levels ✓	**2 max**	**List Rule** If **both** prompt lines used and more than one suggestion is on the line mark the **first** one on each line. If only **one** line used but there is more than one suggestion listed mark first two written. **ALLOW** regulate ***/*** control / reduce , for "low" **ALLOW** named sugar / starch **IGNORE** low fat / healthy / balanced / low "carb" , diet **ALLOW** example of exercise e.g. walking **ALLOW** named drug e.g. metformin **ALLOW** ref to injecting insulin
	(b)	(i)	liver (tissue) ✓	**1**	**ALLOW** hepatic (tissue) **IGNORE** hepatocytes / cells **IGNORE** muscle

Question			Answer	Marks	Guidance
		(ii)	(glucose) for respiration / as respiratory substrate / to release energy ✓ to produce ATP ✓ ATP needed (in muscle contraction) for breaking cross-bridges between myosin and actin / AW ✓ ATP , hydrolysed / to ADP and Pi , to reset myosin heads ✓ ATP for active transport of calcium ions (back) into sarcoplasmic reticulum ✓	**3 max**	**DO NOT ALLOW** produce energy **ALLOW** ATP needed for myosin to detach from actin **ALLOW** ATP hydrolysed for myosin to resume normal position **IGNORE** power-stroke
	(c)		*use of data from Fig.16.1:* calculated rate of oxygen uptake between 0.010 and 0.018 (dm^3 s^{-1}) ✓ calculated reduction in rate of oxygen uptake between 10 and 50% ✓ *supporting statements:* (claim is) correct / incorrect **AND** a comparison of calculated rate with , 20% statement / mean uptake / 0.020 (dm^3 s^{-1}) ✓ *validity statements:* one , woman / reading , is not enough (for a valid conclusion) ✓ (being) 36 weeks pregnant / late pregnancy , is not representative of whole pregnancy / AW ✓	**3 max**	**ALLOW** MP 1 as a percentage i.e calculated value between 50 and 90% (of mean uptake) **Supporting statements MUST match evidence from calculation** e.g. statement is incorrect because my calculation showed reduction of 40% which is higher than 20% **If calculation in MP1 or MP2 is incorrect MP3 can still be awarded using calculation in response.** **ALLOW** only one woman tested
			Total	**11**	

Question			Answer	Marks	Guidance
17	(a)	(i)	(pigments) absorb , light / photons ✓ electrons , excited / raised to higher energy level ✓ accessory pigments pass energy to , reaction centres / primary pigments ✓ primary pigments , become oxidised / lose electrons / pass electrons to ETC ✓ for light dependent reaction / photophosphorylation ✓	4 max	 **ALLOW** named accessory pigments e.g. chlorophyll b / xanthophyll / carotenoids **ALLOW** chlorophyll a for primary pigment **ALLOW** for making , ATP / reduced NADP
		(ii)	*idea that* they have to absorb light of short (er) wavelengths ✓ *idea that* some wavelengths (of light) don't reach , depths / them ✓	1 max	**ALLOW** blue / blue-violet light **ALLOW** wavelengths between 400 and 500nm **ALLOW** high(er) frequency e.g. some wavelengths of light may not reach *Chromista* if they are in deep water
	(b)		*Chromista* (chloroplast) has fewer thylakoids ✓ *Chromista* (chloroplast) has no , inter-granal lamellae / lamellae between thylakoids ✓ plants (chloroplasts) have thylakoids in groups of more than three ✓ plants (chloroplasts) have starch grains / *Chromista* (chloroplast) does not have starch grains ✓	2 max	**IGNORE** reference to external membrane **ALLOW** plants (chloroplasts) have more thylakoids **ALLOW** plant (chloroplasts) have lamellae between thylakoids **ALLOW** thylakoids in plant (chloroplasts) form grana **IGNORE** *Chromista* (chloroplast) has thylakoids in groups of three

Question			Answer	Marks	Guidance
	(c)	(i)	***property*** hydrophobic (region / fatty acid tails) ✓ ***explanation*** (helps to) form bilayer / separates two aqueous regions ✓ ***property*** (region) contains cholesterol ✓ ***explanation*** regulates (membrane) fluidity / AW✓	**2 max**	**IGNORE** stability for explanations ***property*** MUST be linked to its ***explanation***
	(c)	(ii)	compartmentalisation **OR** form / surround , (named) organelles ✓ purpose of / need for , compartments / separation ✓ sites of , chemical reactions / electron carriers / photophosphorylation / chemiosmosis / oxidative phosphorylation ✓ provide attachment sites for , enzymes / pigments ✓ allow formation of concentration gradients ✓	**2 max**	e.g. separating organelles from cytoplasm e.g. form vesicles for transport is **MP1** and **MP2** **ALLOW** ETC for electron carriers **ALLOW** correctly named enzyme e.g. ATP synthase
			Total	**11**	

<table>
<tr><td>18</td><td></td><td></td><td colspan="3">Please refer to the marking instructions on page 4 of this mark scheme for guidance on how to mark this question.

In summary:
Read through the whole answer. (Be prepared to recognise and credit unexpected approaches where they show relevance.)
Using a ‘best-fit’ approach based on the science content of the answer, first decide which of the level descriptors, Level 1, Level 2 or Level 3, best describes the overall quality of the answer.
Then, award the higher or lower mark within the level, according to the Communication Statement (shown in italics):
○ award the higher mark where the Communication Statement has been met.
○ award the lower mark where aspects of the Communication Statement have been missed.

• The science content determines the level.
• The Communication Statement determines the mark within a level.</td></tr>
<tr><td></td><td>(a)*</td><td></td><td>Level 3 (5–6 marks)
Full and detailed plan of how to carry out a valid investigation into the rate of transpiration.

There is a well-developed plan and sequence as well as an appreciation of the need to obtain valid data. The information presented is relevant and clearly explained.

Level 2 (3–4 marks)
Detailed plan of how to carry out a valid investigation into the rate of transpiration.

There is a reasonable explanation and sequence as well as an appreciation of the need to obtain valid data. The information presented is in the most-part relevant and well-explained.

Level 1 (1–2 marks)
Response is aware of how to plan a valid investigation.

The information is basic and communicated in an unstructured way. The information is supported by limited</td><td>6</td><td>Indicative scientific points may include…
IGNORE potometer set up detail
These are not mark points
See appendix
Method and planning to obtain valid data
• method described
• movement of bubble in potometer / mass measured
• timing distance travelled by bubble
• repeating investigation with two different plant species
• repetition to gain replicates
• calculation (rate / mean)
• statistical test

Variables
• named variables controlled
e.g. temperature
humidity
light
wind movement</td></tr>
</table>

			method which may be unclear. **0 marks** No response worthy of credit **NR** No response		surface area of leaves • how variables are controlled
	(b)		insoluble ✓ unreactive / inert ✓ high <u>tensile</u> strength ✓ flexible ✓ can form hydrogen bonds with neighbouring chains ✓	**3 max**	**<u>List Rule</u>** If all **three** prompt lines used and more than one property is on prompt line mark the **first** one on each line. If only **one** or **two** lines used but there is more than one property listed mark the first three properties given. **IGNORE** detail about structure or cell walls **IGNORE** permeable **IGNORE** rigid **IGNORE** strong
	(c)		<u>extracellular</u> **AND** (it) takes place outside of cells / cellulose cannot enter (bacterial) cells ✓	**1 max**	**ALLOW** enzymes must , leave / be secreted from , (bacterial) cells **IGNORE** 'excrete'
			Total	**10**	

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>Guidance</th></tr>
<tr><td>19</td><td>(a)</td><td></td><td>
<table>
<tr><th>Genus</th><th>Diet</th><th>Justification</th></tr>
<tr><td>Camponotus</td><td>mainly carbohydrate</td><td>(RQ is) 1.0</td></tr>
<tr><td>Melophorus</td><td>protein
OR
lipid <u>and</u>
carbohydrate</td><td>(RQ is) 0.9</td></tr>
<tr><td>Cataglyphis</td><td>lipid</td><td>(RQ is) 0.7</td></tr>
</table>
✓✓✓
</td><td>3</td><td>DO NOT ALLOW all three substrates for Melophorus
ALLOW amino acids for protein for Melophorus
ALLOW fat / oil / triglyceride / fatty acid for lipid for Cataglyphis

ALLOW THREE marks for correctly completed table
ALLOW RQs to greater number of sig.figs. e.g. 1.01 / 0.89 / 0.687
If Rf or RV is stated instead of RQ allow max 1 for justification column

ALLOW TWO marks for all correctly calculated RQ values in justification column / on Fig.19.1
OR
ALLOW TWO marks for:
correct two responses in diet <u>column</u>
AND
for correct three justifications written in words i.e.
Camponotus – CO_2 produced is , similar / equal to O_2 consumed
Melophorus - CO_2 produced is 0.07 less than O_2 consumed
Cataglyphis - CO_2 produced is 0.46 less than O_2 consumed

If RQ values have not been calculated or are incorrect

ALLOW ONE mark for correct diet column
OR
correct justification column written in words
OR
two correct RQ values</td></tr>
</table>

Question			Answer	Marks	Guidance
19	(b)		*Similarities* ***Any two from:*** polymers / polysaccharides ✓ have , 6 carbon / C6 , sugars ✓ have 1-4 glycosidic bonds ✓ have CH_2OH side group (in monomers) ✓ *Differences* ***Any two from:*** chitin has β-glycosidic bonds ✓ chitin contains , nitrogen / N / amide / $NH\text{-}CO\text{-}CH_3$ ✓ no 1-6 glycosidic bonds in chitin ✓ no branching in chitin ✓	**4 max**	**ALLOW** have hexose(s) **ALLOW** glycogen has α-glycosidic bonds **ALLOW** ORA for glycogen **ALLOW** ORA for glycogen **ALLOW** ORA for glycogen

			Please refer to the marking instructions on page 4 of this mark scheme for guidance on how to mark this question. ***In summary:*** *Read through the whole answer. (Be prepared to recognise and credit unexpected approaches where they show relevance.)* *Using a 'best-fit' approach based on the science content of the answer, first decide which of the level descriptors,* ***Level 1****,* ***Level 2*** *or* ***Level 3****, best describes the overall quality of the answer.* *Then, award the higher or lower mark within the level, according to the* ***Communication Statement*** *(shown in italics):* o *award the higher mark where the Communication Statement has been met.* o *award the lower mark where aspects of the Communication Statement have been missed.* • ***The science content determines the level.*** • ***The Communication Statement determines the mark within a level.***		
	***(c)**		**Level 3 (5–6 marks)** Full and detailed description of the processes involved in chemiosmosis. Learner demonstrates a detailed understanding of where it occurs, the stages, reactants and products, describing a range of the processes involved. *There is a well-developed line of reasoning with accurate descriptions of the processes. The information presented is relevant and clearly outlined.* **Level 2 (3–4 marks)** Detailed description of the processes involved in chemiosmosis. Learner demonstrates understanding of the where it occurs, stages, reactants and products, describing some of the processes involved. *There is a line of reasoning with accurate descriptions of the processes. The information presented is in the most-part relevant and supported by some detail.* **Level 1 (1–2 marks)** A description of the processes involved in	**6**	**Indicative scientific points may include…** These are **not** mark points **See appendix** • occurs in mitochondria / on membrane • involves inner membrane and matrix • involves movement of hydrogen across membrane • use of enzyme / channel protein / ATP synthase • Hydrogen ions / H^+ ions pumped out of matrix across membrane into intermembrane space • Proton / H+ gradient created • proton-motive force • H^+ ions pass through hydrophilic transmembrane protein • cristae / stalked particles involved • ATP synthase produces ATP from ADP + P_i • H^+ ions move from area of high concentration to low concentration • Some H^+ ions leak back into matrix / process is not completely efficient

			chemiosmosis is attempted, with some understanding of the different stages, reactants and products. *The information is basic and communicated in an unstructured way. The information is supported by limited detail which may be unclear.* **0 marks** No response or no response worthy of credit. **NR** No response		
			Total	**13**	

Question			Answer	Marks	Guidance
20	(a)	(i)	3 **OR** 2 ✓ 5 ✓ 2 ✓	3	
		(ii)	variety / type / age / colour, of beetroot ✓ length / surface area / volume , of beetroot pieces ✓ pieces taken from same part of beetroot / skin removed from beetroot ✓ time taken to wash slices ✓ volume (of samples) removed from solution ✓ pH ✓ use same colorimeter filter / same blank ✓	2 max	**List Rule** If **both** prompt lines used and more than one variable is on the line mark the **first** one on each line. If only **one** line used but there is more than one variable listed mark first two written. **IGNORE** temperature / time / concentration of ethanol **ALLOW** same beetroot / same species **ALLOW** same SA :V / mass **IGNORE** size of beetroot
	(b)	(i)	*x* axis / concentration of ethanol , has no units ✓ should be a line graph (as continuous data) ✓ *x* axis / concentration (of ethanol) , has incorrect scale / 0.6 not included ✓ no title ✓	3 max	**List Rule** If all **three** prompt lines used and more than one criticism is on the line mark the **first** one on each line. If only **one** or **two** lines used but there is more than one criticism listed mark as continuous prose. **ALLOW** bar graph not appropriate for continuous data

Question			Answer	Marks	Guidance
20	(b)	(ii)	(so) can calculate a mean ✓ allows anomalies to be identified ✓ improves repeatability ✓ allows statistical test to be completed ✓	2 max	**IGNORE** average **DO NOT ALLOW** prevents anomalies **IGNORE** remove anomalies **ALLOW** reproducibility **IGNORE** reliability / validity / accuracy **ALLOW** can complete , standard deviation / t-test
			Total	10	

Question			Answer	Marks	Guidance
21	(a)	(i)	sodium ions / Na ions / Na+ , cannot enter ✓ no / prevents , depolarisation of membrane ✓ (membrane) remains at resting potential ✓ prevents action potential being generated ✓ impulse not conducted (along axon) ✓ (so) no release of neurotransmitter ✓	4 max	**Award 3 max** if explanation refers to what would normally happen in neurone instead of in presence of TTX **DO NOT ALLOW** cannot enter membrane **ALLOW** sodium ions / Na ions / Na+ , stay outside **ALLOW** action potential for impulse
		(ii)	*diaphragm is paralysed so:* no / little , change / increase , in volume of thorax ✓ no / little , change / decrease , in pressure in thorax ✓ no / little / less , air drawn into lungs ✓	2 max	**Award 1 max if explanation refers to what would normally happen rather than if diaphragm is paralysed** **ALLOW** chest cavity / lungs for thorax throughout **IGNORE** oxygen
		(iii)	*suggestion:* slows / decreases , heart rate ✓ *explanation:* ***Any two from*** slows transmission of impulse from AVN to ventricles ✓ slows ventricular , systole / contraction ✓ longer delay before ventricular , systole / contraction , begins ✓ increases time (the heart is) in diastole / relaxation ✓	3 max	**ALLOW** bradycardia **ALLOW** prevents / stops for 'slows' for MP2 and MP3 'ventricular' must be mentioned once

Question			Answer	Marks	Guidance
	(b)		no nodes of Ranvier ✓ shorter local , currents / circuits ✓ whole axon needs to be depolarised ✓	1 max	**IGNORE** ref to jumping between nodes **ALLOW** more local currents / circuits **ALLOW** e.g. action potentials need to be generated all the way along the axon
			Total	10	

Question			Answer	Marks	Guidance
22	(a)	(i)	9.7×10^{-3} **OR** 0.0097 ✓✓✓	3	**IGNORE** + or - **ALLOW two marks** if answer is correct but not to two S.F. **ALLOW two marks** if answer is incorrect for correct calculation e.g. $\frac{0.05^2 \times \pi \times 3.7}{3}$ **OR** $\frac{0.029}{3}$ **ALLOW one mark** for $0.05^2 \times \pi \times 3.7$ **OR** 0.029
		(ii)	140 (two s.f.) /142 / 141.7 / 141.67 / 141.6$\dot{}$ ✓✓	2	**ALLOW** one mark if answer is correct but 'decrease' has been calculated so response given as 'minus' number If answer is incorrect **ALLOW one mark** for $\frac{2.9-1.2}{1.2} \times 100$ **OR** $\frac{1.7}{1.2}$ x 100
	(a)	(iii)		1 max	**ALLOW** Calvin cycle / light independent stage for photosynthesis throughout

			removing CO_2 would prevent photosynthesis ✓ CO_2 would be a limiting factor for photosynthesis ✓		**ALLOW** e.g. so they could still photosynthesise e.g. CO_2 needed for photosynthesis
	(b)		at 1510 (lux) the distance moved by the fluid (in respirometer) is , zero / 0 ✓ at 1510 (lux) rate of photosynthesis is equal to rate of respiration ✓ at 1510 (lux) there is no <u>net</u> change in volume in the respirometer ✓	**2 max**	'at 1510 (lux)' only needs to be mentioned **once** throughout **ALLOW** at 1510 (lux) compensation point has been reached
			Total	**8**	

Question			Answer	Marks	Guidance
23	(a)		**W** liver / hepatic ✓ **X** pancreas / pancreatic ✓ **Y** skeletal / striated , muscle ✓	3	**IGNORE** cells **ALLOW** Islet of Langerhans / acini
	(b)		*carboxylic acid* should be carbonic acid / H_2CO_3 ✓ *vagus* (nerve) should be , accelerator / sympathetic / accelerans , (nerve) ✓ *AVN* should be , SAN / sinoatrial node ✓ *baroreceptors* should be chemoreceptors **OR** *pH* should be pressure ✓ *smooth muscle* should be cardiac muscle ✓	max 4	*Error* and correct term must be clearly identified. **ALLOW** copied statements where correct terms replace errors. **IGNORE** carbon dioxide **ALLOW** specialised striated
	(c)	(i)	allows baby to , (try to) hold on / grasp ✓ (crying) draws attention (to the baby) ✓	2	**ALLOW** alerts parent / encourages someone to pick baby up
		(ii)	*description:* (rapid) blinking / shutting / closing (of eyes) ✓ *explanation:* involuntary ✓ prevents , damage to / objects entering , eyes ✓	3	**ALLOW** references to , ducking / raising hands / flinching **ALLOW** unconscious / automatic / innate / instinctive **ALLOW** protects the eyes
			Total	12	

Appendix 1- Q18a-LoR

For Level 1-provide basic statements to show:	For Level 2- provides statements to show:	For Level 3- provides statements to show:
outline a principle of the method / plan **OR** an awareness of a variable that needs to be controlled	a method which ***may*** include ideas of repeating experiment for one plant **or** repeating with a different species with evidence of having to measure distance moved by bubble or mass change of plant **AND** awareness of controlling one named variable	a detailed method which ***may*** include repeating investigation with two different plant species and repetition to gain replicates with evidence of plan to perform calculation or statistical analysis **AND** awareness of controlling more than one named variable **OR** idea of how to control one named variable

Appendix 1- Q19c-LoR

For Level 1-provide basic statements that may include:	For Level 2- provides statements that may include:	For Level 3- provides statements that may include:
idea that it takes place in mitochondria (or chloroplasts) or membranes idea that hydrogen is being moved idea that channel protein or enzyme involved	idea that it takes place in mitochondrial (or chloroplast) membranes idea that hydrogen is involved moving across membrane either being pumped out or diffusing back in idea of concentration gradient idea that ATP synthase is the channel protein or enzyme involved	idea that it takes place in mitochondrial (or chloroplast) membranes idea of channel proteins / stalked particles / cristae idea that hydrogen ions / protons involved moving across membrane being pumped out of matrix and diffusing back in idea of proton gradient / proton motive force impermeability of membrane to hydrogen ions detail of ATP synthase mechanism