OCR
Oxford Cambridge and RSA

Foundation

GCSE

Biology B Twenty First Century Science

J257/03: Breadth in Biology (Higher Tier)

General Certificate of Secondary Education

Mark Scheme for June 2023

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

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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MARKING INSTRUCTIONS

PREPARATION FOR MARKING

RM ASSESSOR

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *RM 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 available in RM Assessor.

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

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 RM Assessor 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 RM Assessor 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 RM Assessor **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 RM Assessor 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, using the Level descriptors to help you decide whether it is a strong or weak answer. The indicative scientific content in the Guidance column 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 skills and science content evidenced within the answer, first decide which set of level descriptors, Level 1, Level 2 or Level 3, best describes the overall quality of the answer.

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 skills and science content determines the level.

The communication statement determines the mark within a level.

Level of response questions on this paper are **X** and **X**

11. Annotations available in RM Assessor

Annotation	Meaning
	Correct response
	Incorrect response
	Omission mark
BOD	Benefit of doubt given
CON	Contradiction
RE	Rounding error
SF	Error in number of significant figures
ECF	Error carried forward
L1	Level 1
L2	Level 2
L3	Level 3
NBOD	Benefit of doubt not given
SEEN	Noted but no credit given
I	Ignore

12. Abbreviations, annotations and conventions used in the detailed Mark Scheme (to include abbreviations and subject-specific conventions).

Annotation	Meaning
/	alternative and acceptable answers for the same marking point
✓	Separates marking points
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

13. **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.

The breakdown of Assessment Objectives for GCSE (9-1) in Biology:

	Assessment Objective
AO1	**Demonstrate knowledge and understanding of scientific ideas and scientific techniques and procedures.**
AO1.1	Demonstrate knowledge and understanding of scientific ideas.
AO1.2	Demonstrate knowledge and understanding of scientific techniques and procedures.
AO2	**Apply knowledge and understanding of scientific ideas and scientific enquiry, techniques and procedures.**
AO2.1	Apply knowledge and understanding of scientific ideas.
AO2.2	Apply knowledge and understanding of scientific enquiry, techniques and procedures.
AO3	**Analyse information and ideas to interpret and evaluate, make judgements and draw conclusions and develop and improve experimental procedures.**
AO3.1	Analyse information and ideas to interpret and evaluate.
AO3.1a	Analyse information and ideas to interpret.
AO3.1b	Analyse information and ideas to evaluate.
AO3.2	Analyse information and ideas to make judgements and draw conclusions.
AO3.2a	Analyse information and ideas to make judgements.
AO3.2b	Analyse information and ideas to draw conclusions.
AO3.3	Analyse information and ideas to develop and improve experimental procedures.
AO3.3a	Analyse information and ideas to develop experimental procedures.
AO3.3b	Analyse information and ideas to improve experimental procedures.

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>AO element</th><th>Guidance</th></tr>
<tr><td>1</td><td>(a)</td><td>(i)</td><td>
<table>
<tr><th>Process</th><th>It requires glucose</th><th>It requires oxygen</th><th>It produces carbon dioxide</th><th>It produces water</th><th>It produces lactic acid</th></tr>
<tr><td>Aerobic respiration</td><td>✓</td><td>✓</td><td>✓</td><td>✓</td><td></td></tr>
<tr><td>Anaerobic respiration</td><td>✓</td><td></td><td></td><td></td><td>✓</td></tr>
</table>
✓✓✓
</td><td>3</td><td>1.1</td><td>5 columns correct = 3 marks
4 columns correct = 2 marks
3/2 columns correct = 1 mark</td></tr>
<tr><td></td><td></td><td>(ii)</td><td>Aerobic respiration produces more ATP than anaerobic respiration. ✓
Anaerobic respiration produces more ATP than aerobic respiration. ☐
Both aerobic and anaerobic respiration produce the same amount of ATP. ☐
Neither aerobic or anaerobic respiration produces ATP. ☐
✓</td><td>1</td><td>1.1</td><td></td></tr>
<tr><td></td><td>(b)</td><td>(i)</td><td>Any two from:

Mitochondria are needed for (cellular) respiration ✓

Mitochondria produce ATP ✓

(Heart) muscle needs ATP to contract ✓</td><td>2</td><td>2.1</td><td>DO NOT ALLOW anaerobic respiration occurs in the mitochondria

ALLOW mitochondria release energy

DO NOT ALLOW mitochondria produce /make energy

IGNORE to pump blood.</td></tr>
<tr><td></td><td></td><td>(ii)</td><td>A number or range between 33 and 60 (inclusive) ✓</td><td>1</td><td>2.2</td><td></td></tr>
</table>

Question			Answer	Marks	AO element	Guidance
2	(a)	(i)	**Any two from:** (From 1940) the percentage of rainforest decreased until around 1987 ✓ From 1987 the percentage of rainforest increased ✓ Idea that there has been a net/overall/25% decrease ✓	2	3.1a	**ALLOW** any year from 1987 to 1997 **ALLOW** any year from 1987 to 1997 **N.B stated year e.g. 1987 (or equivalent) need only be stated to award MP1 and MP2** **If no marks awarded** **ALLOW** 'it decreased and then increased' for 1 mark
		(ii)	Any date from 1983 to 1996 inclusive ✓	1	3.1b	**ALLOW** a range given within the stated values
		(iii)	2030 ✓	1	3.1b	
	(b)	(i)	**Any two from (benefits):** Idea of carbon offsetting e.g. Act as a carbon sink, plants use carbon dioxide (in photosynthesis) ✓ Idea of tackling global warming ✓ Idea that it will help tackle climate change ✓ Maintain/increase biodiversity ✓ Prevent extinction of species / reduce number of endangered species ✓ Protects/improves food supply/chains ✓ Provide materials/resources ✓ Protect populations ✓	2	2.1	**ALLOW** any sensible suggestion **ALLOW** protect endangered species **ALLOW** named examples of resources

Question			Answer	Marks	AO element	Guidance
			Provides/protect habitats ✓ Idea of aesthetics (wellbeing) ✓ For tourism ✓ Prevent landslides/flooding/soil erosion ✓			
		(ii)	**Any two from:** ***Challenges in relation to growing trees*** Idea that (tree growth) takes a long time ✓ (Because it's) difficult to make trees germinate / mature / survive ✓ Soil quality may be poor ✓ Tree selection e.g. right saplings ✓ Unpredictable weather may affect growth ✓ ***Challenges in relation to the land*** Idea that there may be less land available because it is being used for another named purpose ✓ Disruption of existing habitats / organisms living in area to be reforested ✓ ***Challenges in relation to people*** No obvious direct benefit for people ✓ May lose income / economic implications ✓ ***Challenges in relation to money*** Costs money / can be expensive (to conserve/re-grow species or habitats) ✓ May need to compensate people ✓ ***Challenges to stopping it shrinking*** Continued deforestation / illegal logging ✓ Idea that it could be difficult to protect ✓	**2**	**2.1**	**ALLOW** any sensible suggestion

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>AO element</th><th>Guidance</th></tr>
<tr><td></td><td>(c)</td><td></td><td>
<table>
<tr><th></th><th>Sexual reproduction</th><th>Asexual reproduction</th></tr>
<tr><td>Occurs at a slower rate</td><td>✓</td><td></td></tr>
<tr><td>Offspring are all susceptible to the same diseases</td><td></td><td>✓</td></tr>
<tr><td>Only one parent is needed</td><td></td><td>✓</td></tr>
<tr><td>Provides offspring with genetic variation</td><td>✓</td><td></td></tr>
</table>
✓✓✓
</td><td>3</td><td>1.1</td><td>4 correct = 3 marks
3 correct = 2 marks
2 correct = 1 mark</td></tr>
</table>

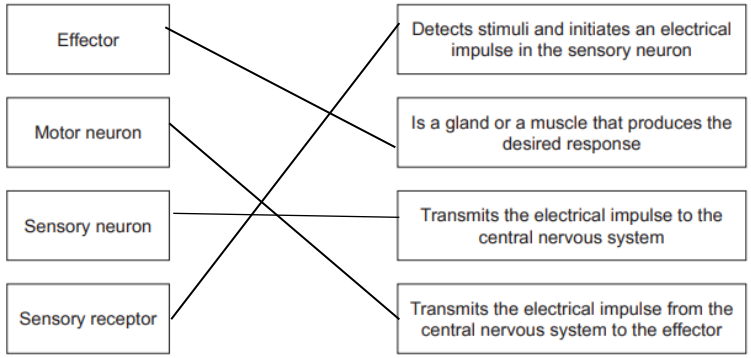
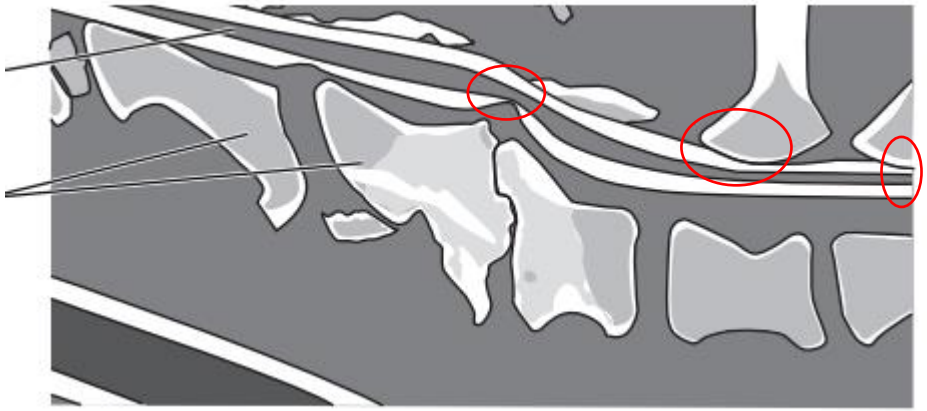
Question			Answer	Marks	AO element	Guidance
3	(a)		Idea that disease compromises our health / health is being disease free / if you have a disease you are not healthy / people with good health are less likely to get a disease ✓ **Max one from:** Health is the state of physical and mental well being ✓ Disease can affect mental and/or physical wellbeing ✓ Health is compromised by infection by a pathogen/an organism's genes/environment /lifestyle or trauma ✓ People with disease/unhealthy individuals are more likely to succumb to other disease. ✓	**2**	**1.1**	**ALLOW** named lifestyle factors e.g diet, exercise **ALLOW** named examples of disease **ALLOW** idea that physical health can impact on mental health
	(b)		pathogens ✓ digest ✓ antibodies ✓ memory ✓	**4**	**1.1**	
	(c)		**Any one from:** Water loss may exceed water gain ✓ May become (very) dehydrated ✓ Osmotic effect on cells / cells will shrivel/shrink/crenate ✓ Idea blood composition becomes too concentrated ✓ Risk of death✓ Impact excretion/kidney/toxin removal ✓	**1**	**2.1**	**ALLOW** named examples of minerals lost from the body e.g K **ALLOW** cells need water to function **ALLOW** blood pressure changes **ALLOW** risk of coma

Question			Answer	Marks	AO element	Guidance
	(d)		**Any one from**: Good sanitation ✓ Good hygiene ✓ Isolating those with the disease ✓	1	2.1	**ALLOW** examples of good hygiene (hand washing) and good sanitation (safe disposal of human waste). **ALLOW** quarantine and named examples of prevention of physical contact **ALLOW** vaccination **IGNORE** education unqualified
	(e)		**Any three from:** Both have a cell membrane ✓ Both have cytoplasm ✓ Both have ribosomes✓ Both have genetic material/DNA ✓	3	1.1	**IGNORE** cell wall **IGNORE** microscopic **DO NOT ALLOW** both have genetic material contained in a nucleus

<table>
<tr><th colspan="3">Question</th><th>Answer</th><th>Marks</th><th>AO element</th><th>Guidance</th></tr>
<tr><td>4</td><td>(a)</td><td></td><td>
<table>
<tr><th>Statement</th><th>True</th><th>False</th></tr>
<tr><td>During interphase the number of chromosomes double.</td><td>✓</td><td></td></tr>
<tr><td>Gametes are produced by mitosis.</td><td></td><td>✓</td></tr>
<tr><td>In meiosis there are two cell divisions.</td><td>✓</td><td></td></tr>
<tr><td>Interphase occurs in both mitosis and meiosis.</td><td>✓</td><td></td></tr>
</table>
✓✓</td><td>2</td><td>1.1</td><td>4 correct = 2 marks
3/2 correct = 1 mark</td></tr>
<tr><td></td><td>(b)</td><td></td><td>Idea that the number of chromosomes returns to the original number/does not double at fertilisation when gametes fuse/zygote forms/in the offspring ✓</td><td>1</td><td>1.1</td><td>ALLOW return to the diploid number
ALLOW correct reference to chromosome number if a species is named or an example of the haploid number e.g 23 and diploid number e.g 46 are present in the answer</td></tr>
<tr><td></td><td>(c)</td><td></td><td>Changes in the cells DNA ✓

Uncontrollable/rapid cell division/mitosis ✓</td><td>2</td><td>1.1</td><td>ALLOW gene mutation

DO NOT ALLOW cells divide by meiosis
IGNORE mutation unqualified, uncontrolled growth
IGNORE cells multiply/reproduce
IGNORE growth</td></tr>
</table>

Question			Answer	Marks	AO element	Guidance
5	(a)		 ✓ ✓ ✓	3	1.1	4 correct = 3 marks 2/3 correct = 2 marks 1 correct = 1 mark
	(b)		Uncoordinated movement /slower movement/slower reactions/poor balance/pain/muscle spasms/unconscious movement✓	1	2.1	**ALLOW** any sensible suggestion **IGNORE** wobbles unqualified **IGNORE** if the dog can walk properly
	(c)		 Arrow drawn on Fig 5.1 where a compression is shown ✓	1	3.2a	

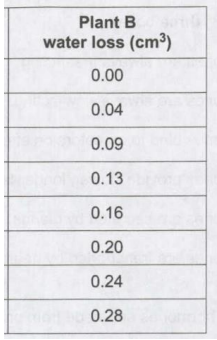
Question	Answer	Marks	AO element	Guidance
(d)	**Any one from**: The outcome of the surgery e.g how successful it is likely to be ✓ Other medical conditions the dog may have ✓ Cost ✓ Age of the dog ✓ Severity of the disease ✓ How high risk is the surgery ✓	1	3.2a	**ALLOW** named risks such as use of anaesthetic/ nature of the surgery (spinal) **IGNORE** consent **IGNORE** benefit outweighs risk **ALLOW** any sensible suggestion
(e)	(a reflex response) does not involves the brain/processing centre **ORA**✓ (a reflex response) uses only the relay neuron (in the spinal cord-) **ORA**✓	2	2.1	**IGNORE** passes to the CNS

Question			Answer	Marks	AO element	Guidance
6	(a)		**Max two from:** Idea that grass photosynthesises ✓ Grass produces glucose/starch carbohydrate ✓ Plants convert glucose into starch/cellulose/long chain carbohydrate ✓ **Max two from:** Idea that restricted grazing/grass intake restricts glucose/carbohydrate intake ORA ✓ Idea that alternative diet could control/contain less carbohydrate ✓	3	2.1	**ALLOW** grass is a source/contains glucose/sucrose/sugar//starch/cellulose/carbohydrate **ALLOW** starch/cellulose/sugar/sucrose **ALLOW** starch in grass will be digested to release sugar/glucose
	(b)		Horse C/New Forest ✓ Uses the graph to identify that it is a breed that is at a high risk and has two other risk factors/names the two risk factors✓	2	3.2a	**DO NOT ALLOW** it has the most risk factors unqualified
	(c)		Insulin / Glucagon ✓	1	1.1	**ALLOW** adrenaline
	(d)		**Any three from:** Some parts of the plant will not be eaten e.g roots ✓ Not all of the grass will be digested/some will be as faeces ✓ Used in (cellular) respiration ✓	3	2.1	**IGNORE** waste **ALLOW** egested **DO NOT ALLOW** excreted in faeces **ALLOW** excreted in urine

Question			Answer	Marks	AO element	Guidance
7	(a)		**Any three from:** Measure the persons resting pulse rate/heart rate/breathing rate ✓ (a person exercises) measure pulse rate/heart rate/breathing rate after exercise ✓ determine how long it takes for pulse rate/heart rate/breathing rate to return to normal ✓	3	1.2	**ALLOW** a description of how to take the measurement **IGNORE** take rate during exercise
	(b)		Sample size should be a minimum of 5 people ✓ **Any one from:** Idea that larger samples are more likely to representative e.g will include different ages, gender, fitness levels, body mass, ethnicity✓ Too few and you may not see any difference between recovery rates ✓	2	3.3a	**ALLOW** gives a good range of recovery rates **ALLOW** idea that it is less affected by chance

Question			Answer	Marks	AO element	Guidance
8	(a)	(i)	**Any one from:** Do you take any other medication? ✓ Do you have any other health problems? ✓ How old are you? ✓ Could you be pregnant? ✓ Are you allergic to any of the ingredients / any other medication? ✓ Do you have headaches/migraines? ✓ Do you have any issues with your period? ✓	1	3.2a	**ALLOW** any sensible suggestion
		(ii)	**Any one from (risk):** Could be misused ✓ Could have adverse reactions ✓ Person could lie in the questions ✓ May not be fully informed ✓ Religious / ethical arguments ✓ May not read the advice/misunderstand the advice ✓ Blood pressure and BMI aren't monitored in person ✓ **Any one from (benefit):** May prevent unwanted pregnancies ✓ More convenient e.g no waiting time, speed, easy✓ Pill has been around for a long time as a drug so side effects are known and it is generally safe to use ✓ Women may be more likely to get the pill than if they have to go to their doctors. ✓	2	3.2a	**ALLOW** any sensible suggestion **ALLOW** idea that it frees up GP time for other consults / financial benefits to NHS
	(b)		Progesterone inhibits production of FSH ✓ Prevents follicles/eggs developing/maturing ✓ No egg is released/ovulation does not occur (so can't get pregnant)✓	3	1.1	**ALLOW** FSH and LH **IGNORE** ref to progesterone maintaining lining of uterus

Question			Answer	Marks	AO element	Guidance
	(c)		Hormones are always fast-acting. ☐ Hormones are always slow-acting. ☐ Hormones bind to receptors on effectors. ✓ Hormones provide slower, longer-lasting responses. ✓ Hormones are secreted by glands. ✓ Hormones are transported by neurons. ☐ . ✓✓	2	1.1	Three correct = 2 marks Two correct = 1 mark
	(d)		Biuret and purple ✓ Ethanol and cloudy ✓	2	1.2	**ALLOW** one mark if both reagents are correct and no other mark awarded

Question			Answer	Marks	AO element	Guidance
9	(a)		8 data plots ✓✓	2	1.2	**ALLOW** no obvious data plot for 0.0 if a line is drawn for plant B and it goes through the origin Deduct one mark for an incorrect data plot. Half square tolerance  Plant B water loss (cm^3) 0.00 0.04 0.09 0.13 0.16 0.20 0.24 0.28
	(b)		**First check the answer on answer line** **If answer = 0.003 award 2 marks** Any 'plant A water loss' value ÷ corresponding 'time from the start of investigation' value, e.g. 0.18 ÷ 60 ✓ = 0.003 cm^3/min ✓	2	2.2	**ALLOW** answer given in standard form 3×10^{-3}
	(c)		Plant B has a higher transpiration rate than plant A / Plant B lost more water than plant A / Plant B loses water more quickly than Plant A / Plant B has a higher rate of water loss than plant A **ORA** ✓	1	3.2b	**ALLOW** as time increases so does water loss from both plants.
	(d)		**Any two from:** (at higher temperatures) water loss from leaf cells by evaporation increases ✓ More/faster diffusion of water ✓ Out of the stomata ✓	2	1.1	

Question			Answer	Marks	AO element	Guidance
10	(a)		Punnett square drawn showing that both parents must have a genotype of Hh (both heterozygous) ✓	3	3.2b	**ALLOW** any letter (upper and lower case) to indicate the genotype in place of Hh as not given in question **DO NOT ALLOW** more than one letter used in the genotype
			Correct offspring identified✓		2.1	**DO NOT ALLOW** if any genotype other than hh (or equivalent) is highlighted **ECF**
			Probability is therefore 0.25 ✓		2.2	**ECF** **DO NOT ALLOW** if percentage does not match hh in punnet square **ALLOW** 25%, 1 in 4, ¼ **IGNORE** ratios
	(b)		**Any two from:** A genetic test will confirm her genotype/the alleles she has ✓ If she has the disease she can receive treatment sooner/informs healthcare/take preventative measures✓ Idea that if the test is negative she won't need any treatment/no anxiety about future/peace of mind ✓	2	2.1	**IGNORE** it will confirm if she has the genes. **ALLOW** named positive/negative impacts for future decisions
	(c)		**First check the answer on answer line** **If answer = 18 833 award 4 marks**	4		

Question			Answer	Marks	AO element	Guidance
			56 500 000 ÷ 150 = 376 666.667 ✓ 376 666.667 x 5 ÷100 ✓ = 18833.3 (recurring) ✓ = 18833 (nearest whole number) ✓		**2.2 x 3** **1.2**	**ECF** throughout **ALLOW** an incorrect evaluated number which is rounded to a whole number **ALLOW** 376667 = 2 marks **ALLOW** 28250 = 2 marks **ALLOW** 2825000 = 2 marks

Question			Answer	Marks	AO element	Guidance
11	(a)		Trophic level 2 are primary consumers, they are herbivores/eat the trees and leaf litter /plants/producers ✓ Trophic level 3 are secondary consumers ,they are carnivores/eat the caterpillars and earthworms /primary consumers/herbivores/animals ✓	2	2.1	**IGNORE** references to biomass **IGNORE** omnivore
	(b)		**First check the answer on answer line** **If answer = 10 (%) award 3 marks** Select correct bars for primary and secondary consumers to use in calculation -10squares and 1 square ✓ (1 ÷ 10) x 100 ✓ = 10 (%) ✓	3	2.2	**ALLOW** 50 and 5 squares as using area not length of bars throughout answer **ECF** if incorrect bars selected in MP1 or incorrect number of squares/area counted for primary and secondary consumers.
	(c)		**Any two from:** Plants produce glucose which is converted to biomass ✓ Biomass produced by plants is eaten by animals at the start of the food chain/biomass produced by plants is transferred along the food chain ✓ idea that when plants or animals are eaten the (named) molecules are broken down and used to build biomass/named molecules ✓	2	1.1	**ALLOW** Plants are autotrophs, use products made to create biomass **DO NOT ALLOW** plants make their own energy **ALLOW** animals are heterotrophs
	(d)		**Any two from:** water carbon nitrogen ✓	1	1.1	**ALLOW** oxygen, hydrogen **ALLOW** named mineral e.g phosphorous/phosphates, sulfur **IGNORE** minerals, vitamins, carbon dioxide

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