

OCR

Oxford Cambridge and RSA

...day June 20XX – Morning/Afternoon

GCSE (9–1) Biology A (Gateway Science)

J247/01 Paper 1 (Foundation Tier)

SAMPLE MARK SCHEME

Duration: 1 hour 45 minutes

MAXIMUM MARK 90

This document consists of 16 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. Work crossed out:
 - a. where a candidate crosses out an answer and provides an alternative response, the crossed out response is not marked and gains no marks
 - b. if a candidate crosses out an answer to a whole question and makes no second attempt, and if the inclusion of the answer does not cause a rubric infringement, the assessor should attempt to mark the crossed out answer and award marks appropriately.
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. There is a NR (No Response) option. Award NR (No Response)
 - if there is nothing written at all in the answer space
 - OR if there is a comment which does not in any way relate to the question (e.g. 'can't do', 'don't know')
 - OR if there is a mark (e.g. a dash, a question mark) which isn't an attempt at the question.Note: Award 0 marks – for an attempt that earns no credit (including copying out the question).
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, 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.

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.

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

	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.

SECTION A

Question	Answer	Marks	AO element	Guidance
1	A	1	2.1	
2	B	1	1.1	
3	B	1	1.1	
4	D	1	2.2	
5	A	1	1.1	
6	C	1	1.1	
7	C	1	1.1	
8	B	1	1.1	
9	C	1	1.1	
10	D	1	1.1	
11	D	1	1.1	
12	B	1	1.1	
13	D	1	1.1	
14	D	1	1.2	
15	B	1	1.1	


SECTION B

Question		Answer	Marks	AO element	Guidance
16	(a)	4 1 2 5 3 all correct = 2 one out of sequence = 1	2	2 x 1.2	
	(b)	as a stain (1) so can see organelles (1)	1 1	1.2 1.2	allow to increase contrast
	(c) (i)	contains genes / genetic material / DNA (1) controls cell (functions) (1)	1 1	1.1 1.1	allow protein synthesis
	(ii)	(onion cells) do not photosynthesize (1) (because) they are underground / in the dark (1)	1 1	2.1 2.1	
	(d)	0.25 (mm) (2)	2	2 x 1.2	allow $1.5 \div 6$
	(e)	more difficult to focus (1) smaller field of view (1)	1 1	2.2 2.2	

Question		Answer	Marks	AO element	Guidance
17	(a)	detected by receptors in skin (1)	1	2.1	To gain marks these need to be in correct sequence ignore brain
		impulse sent along sensory neurone (1)	1	1.1	
		to spinal cord / CNS (1)	1	1.1	
		impulse sent along motor neurone (1)	1	1.1	
		to (hand/arm) muscles / effectors (1)	1	2.1	
	(b)	to avoid (further) damage (1)	1	2.1	allow ora
		The reaction needs to be rapid (1)	1	2.1	
		The brain would slow down the reaction time (1)	1	2.1	
18	(a)	stop evaporation of water (1)	1	2.2	
		so any loss in mass/water is from the plant (1)	1	2.2	
	(b)	same temperature (1)	3	3.3a	allow same humidity
		same light intensity (1)			
		same windspeed / air movement (1)			

Question	Answer	Marks	AO element	Guidance
(c) *	<p>Please refer to the marking instructions on page 4 of this mark scheme for guidance on how to mark this question.</p> <p>Level 3 (5–6 marks) Concludes whether this result would be expected in this experiment and includes scientific reasons in their answer <i>There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.</i></p> <p>Level 2 (3–4 marks) Draws a conclusion from the data supported with suitable calculations <i>There is a line of reasoning presented with some structure. The information presented is relevant and supported by some evidence.</i></p> <p>Level 1 (1–2 marks) Draws a conclusion from the data without the use of calculations <i>There is an attempt at a logical structure with a line of reasoning. The information is in the most part relevant.</i></p> <p>0 marks <i>No response or no response worthy of credit.</i></p>	6	2 x 2.2 2 x 3.1a 2 x 3.2a	<p>AO3.2a: Analyse the information from the experiment and use judgement to ascertain if the result is as expected</p> <ul style="list-style-type: none"> • Bigger plants would be expected to lose more mass – because of their larger surface/ora • Smaller plants could have lost more mass in this experiment – because they may have a higher number of stomata per unit area/ora • Results may be inconclusive as the experiment has not been repeated/there are an insufficient number of repeats <p>AO3.1a: Apply knowledge and understanding of the experiment with respect to the data</p> <ul style="list-style-type: none"> • Convert from water loss to percentage water loss plant A 12.6% plant B 15.4% and explained • Plant A lost more water / lost water more slowly • Plant A lost 261-228 = 33g, • Plant A rate of water loss - 33/24 = 1.38 g/hr • Plant B lost 273-231 = 42g

Question	Answer	Marks	AO element	Guidance
				<ul style="list-style-type: none"> • Plant B rate of water loss - $42/24 = 1.75 \text{ g/hr}$ • Plant B lost 5g more mass than plant A <p>AO2.2: Apply knowledge of transpiration to the different leaf sizes</p> <ul style="list-style-type: none"> • both experiments lose mass • that mass can be because of water loss • that water loss is due to transpiration

Question		Answer	Marks	AO element	Guidance
19	(a)	osmosis (1)	1	1.1	
	(b)	absorbed water (1) Higher water potential/water concentration outside ORA (1)	1 1	2.1 3.1a	allow (movement) from higher to lower water potential / from higher to low water concentration
	(c)	(potato has) same water potential / water concentration (as solution) (1) no (net) water loss or gain (1)	1 1	3.1a 2.1	
20	(a)	do more repeats/ more distances / greater range of distances (1) longer than 10 seconds (1)	1 1	3.3b 3.3b	allow specific values if they match the marking points ignore simply do more measurements
	(b)	bubbles may be different sizes (1) may miscount / difficult to count (1)	1 1	2.2 2.2	
	(c)	oxygen (1)	1	1.1	
	(d)	respiration (is also occurring) (1) some oxygen is used up (in respiration) / AW (1)	1 1	2.1 2.1	allow idea that oxygen given out is the net production
	(e) (i)	 as the light intensity decreases (1) there are fewer bubbles in 10 seconds (inverse proportional relationship) (1)	2	2 x 2.1	

Question			Answer	Marks	AO element	Guidance
		(ii)	<p>any two from</p> <p>as the distance increases, the light intensity decreases (1)</p> <p>as the light intensity decreases, there is less light/energy for photosynthesis (1)</p> <p>the line curves because the light will not decrease to zero / AW (1)</p>	2	2 x 1.1	
21	(a)	(i)	6 (cm ⁻¹) (1)	1	1.1	
		(ii)	<p>7.6 x 10⁻³</p> <p>3.0 x 10⁻³</p> <p>1.5 x 10⁻³</p> <p>correct calculation of 1/time (1)</p> <p>answer in standard form (1)</p>	1 1	1.2 1.2	
		(iii)	<p>Comment on the rate of colour change / smaller block changed faster (1)</p> <p>Diffusion alone is sufficient in smaller organisms / smaller organisms have a larger surface area to volume ratio / diffusion alone may not be effective in multi cellular organisms (may require circulatory system) (1)</p>	1 1	2.2 2.2	ORA
	(b)		<p>small size (1)</p> <ul style="list-style-type: none"> • to travel through capillaries (1) • to get in to small vessels/capillaries (1) <p>biconcave disc shape (1)</p> <ul style="list-style-type: none"> • large surface area :volume (1) 	5	5 x 1.1	<p>can only gain explanation marks (bullet points) if correctly linked to a feature</p> <p>max 4 marks if only given features without explanations</p>

Question		Answer	Marks	AO element	Guidance
		haemoglobin (1) <ul style="list-style-type: none"> to carry oxygen (1) lack of nucleus (1) (so) more room (for haemoglobin) (1)			
22	(a)	produces acids (1) but produces fatty acids (2)	2	2 x 2.2	
	(b)	Y axes correctly labelled, including units (1) Y axis even scales occupying more than half of the page (1) all points correctly plotted = 2 marks but at least 3 points correctly plotted = 1 mark line of best fit (1)	1 1 2 1	2.2 2.2 2 x 2.2 2.2	
	(c)	at 20°C: slower reaction (1) particles moving more slowly (1) less frequent collisions (1)	1 1 1	3.1a 2.1 2.1	allow reverse argument referring to 40°C
	(d)	At 80°C: slower reaction (1) enzyme denatured (1) shape of active site changed / cannot bind to substrate (1)	1 1 1	3.1a 2.1 2.1	allow reverse argument referring to 40°C

Question		Answer	Marks	AO element	Guidance	
	(e)	(i)	(optimum) could be either side of 40°C / could be anywhere between 40°C and 60°C (1)	1	3.1a	
		(ii)	Do more repeats (1) Idea of narrower intervals around 40°C (1)	2	2 x 3.3b	allow 30-50°C
	(f)		any two from use a colorimeter – so it's objective / AW (1) have the same student doing all observations – so there is a consistent judgement / AW (1) repeat the experiment at each temperature – can take mean/average (1)	2	2 x 3.3b	allow light meter allow colour chart / serial dilution

Summary of updates

Date	Version	Change
May 2018	2	Revised with accessibility principles applied.
October 2019	2.1	Question 21(a) Mark scheme correction to 6:1