

# Foundation

**GCSE**

**Biology A Gateway**

**J247/01: Paper 1 (Foundation Tier)**

General Certificate of Secondary Education

**Mark Scheme for June 2025**

OCR (Oxford Cambridge and RSA) is a leading UK awarding body, providing a wide range of qualifications to meet the needs of candidates of all ages and abilities. OCR qualifications include AS/A Levels, Diplomas, GCSEs, Cambridge Nationals, Cambridge Technicals, Functional Skills, Key Skills, Entry Level qualifications, NVQs and vocational qualifications in areas such as IT, business, languages, teaching/training, administration and secretarial skills.

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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 40% 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 the annotation 'SEEN' to confirm that the work has been seen and mark any responses using the annotations in section 11.
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 is not an attempt at the question.

Note: Award 0 marks – for an attempt that earns no credit (including copying out the question).

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.**
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 question on this paper is **20a**

## 11. Annotations available in RM Assessor

Annotation	Meaning
	Correct response
	Incorrect response
	Omission mark
	Benefit of doubt given
	Contradiction
	Rounding error
	Error in number of significant figures
	Error carried forward
	Level 1
	Level 2
	Level 3
	Benefit of doubt not given
	Noted but no credit given
	Ignore

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

<b>Annotation</b>	<b>Meaning</b>
/	alternative and acceptable answers for the same marking point
✓	Separates marking points
<b>DO NOT ALLOW</b>	Answers which are not worthy of credit
<b>IGNORE</b>	Statements which are irrelevant
<b>ALLOW</b>	Answers that can be accepted
( )	Words which are not essential to gain credit
—	Underlined words must be present in answer to score a mark
<b>ECF</b>	Error carried forward
<b>AW</b>	Alternative wording
<b>ORA</b>	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 A:

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

**For answers to Section A if an answer box is blank ALLOW correct indication of answer e.g. circled or underlined.**

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

Question		Answer	Marks	AO element	Guidance
16	(a)	Base – <b>A</b>  Phosphate – <b>C</b>  Sugar – <b>B</b>  ✓✓	2	2 × 1.1	All three correct = 2 marks 2 or 1 correct = 1 mark
	(b)	Double helix ✓ Molecule ✓ Polymer ✓	3	3 × 1.1	Each additional box ticked will negate a marking point.
	(c)	<b>First check the answer on the answer line</b> <b>If answer = 35 (%) award 3 marks</b>  (15 x2) = 30 ✓  (100-30) = 70 ✓  (70 ÷ 2) = 35 (%) ✓	3	3 × 2.1	

Question		Answer	Marks	AO element	Guidance																				
17	(a)	<p><b>First check the answer on the answer line</b>  <b>If answer = (x) 400 award 2 marks</b></p> <p>10 x 40 ✓                      = (x) 400 ✓</p>	2	1.2 2.2																					
	(b)	<p><b>Any three from:</b>                      (Draw with) continuous/unbroken lines ✓                      No shading ✓                      (Label) lines should not cross ✓                      Label lines should not have arrow heads ✓                      Magnification should be added ✓</p>	3	3 × 2.2	<p><b>ALLOW</b> no gaps/dashes  <b>ALLOW</b> smooth/clear/thin/single lines</p> <p><b>IGNORE</b> add sub-cellular structures/named sub-cellular structure</p>																				
	(c)	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 2px;">Cell structure</th> <th style="padding: 2px;">In animal cells only</th> <th style="padding: 2px;">In bacterial cells only</th> <th style="padding: 2px;">In both animal and bacterial cells</th> </tr> </thead> <tbody> <tr> <td style="padding: 2px;">Ribosome</td> <td></td> <td></td> <td style="padding: 2px;">(✓)</td> </tr> <tr> <td style="padding: 2px;">Nucleus</td> <td style="padding: 2px;">✓</td> <td></td> <td></td> </tr> <tr> <td style="padding: 2px;">Plasmid</td> <td></td> <td style="padding: 2px;">✓</td> <td></td> </tr> <tr> <td style="padding: 2px;">Mitochondria</td> <td style="padding: 2px;">✓</td> <td></td> <td></td> </tr> </tbody> </table> <p style="text-align: right; margin-top: 10px;">✓✓✓</p>	Cell structure	In animal cells only	In bacterial cells only	In both animal and bacterial cells	Ribosome			(✓)	Nucleus	✓			Plasmid		✓		Mitochondria	✓			3	3 × 1.1	<p>3 correct rows = 3 marks                      2 correct rows = 2 marks                      1 correct row = 1 mark</p> <p><b>DO NOT ALLOW</b> more than one tick in each row.</p>
Cell structure	In animal cells only	In bacterial cells only	In both animal and bacterial cells																						
Ribosome			(✓)																						
Nucleus	✓																								
Plasmid		✓																							
Mitochondria	✓																								
	(d)	Ribosome ✓	1	1.1																					
	(e)	<p><b>Any two from:</b>                      Diffusion ✓                      Osmosis ✓                      Active transport ✓</p>	2	2 × 1.1																					

Question		Answer	Marks	AO element	Guidance
18	(a)	Glucose / sugar ✓	1	1.1	<b>ALLOW</b> monosaccharide <b>IGNORE</b> disaccharides
	(b)	<p><b>Any three from:</b> Enzymes are specific ✓</p> <p>Active site has a particular shape / Active site is complementary to the substrate ✓</p> <p>Only starch will fit/bind (into active site)✓ / (protein) won't fit/bind (into active site) ✓</p> <p>Enzyme substrate complexes can't form ✓</p>	3	3 × 2.1	<p><b>ALLOW</b> (amylase) breaks down starch / proteases break down protein</p> <p><b>ALLOW</b> ESC's <b>ALLOW</b> reference to lock and key method</p> <p>Denaturing negates marking points 2,3 and 4</p>
	(c)	(Enzyme) will denature ✓	1	1.1	<b>ALLOW</b> active site/enzyme will change shape <b>IGNORE</b> break down
	(d) (i)	<p>The activity of the enzyme increases and then decreases ✓</p> <p>Activity peaks/optimum temperature at 50 °C ✓</p>	2	2 × 3.1a	<p><b>ALLOW</b> temperature range between 44-55 °C Temperature increases up to 50 °C then decreases = 2</p>
	(ii)	Smaller temperature intervals ✓	1	3.3b	<b>ALLOW</b> test more temperatures around 50 °C /around optimum <b>IGNORE</b> repeat

Question			Answer	Marks	AO element	Guidance
19	(a)	(i)	Progesterone ✓	1	1.1	
		(ii)	Oestrogen ✓	1	1.1	
	(b)	(i)	May, June, July ✓	1	3.2a	All three months required for the answer. Answers in any order <b>DO NOT ALLOW</b> more than three named months <b>IGNORE</b> figures
		(ii)	December and January ✓	1	3.2a	Both months required for the answer Answers in any order <b>DO NOT ALLOW</b> more than two named months <b>IGNORE</b> figures
		(iii)	In Texas there are more months with higher percentages/ of ewes ovulating (than Idaho) ORA ✓  Data quote to support statement ✓	2	2 × 3.1b	<b>ALLOW</b> in Texas over the year they have higher percentages/of ewes ovulating (than Idaho)  e.g. Texas doesn't drop below 31%  Texas has 5 months with higher ovulating ewes and Idaho has 4 months = 2
		(iv)	They would give <b>birth</b> in the winter ✓	1	2.1	<b>ALLOW</b> give <b>birth</b> when it is too cold

Question		Answer	Marks	AO element	Guidance
20	(a)	<p>Please refer to the marking instructions on page 4 of this mark scheme for guidance on how to mark this question.</p> <p><b>Level 3 (5–6 marks)</b> Explanation of the role of the jackrabbit's skin in keeping cool <b>AND</b> Explanation how its ears are adapted to increase heat loss.</p> <p><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><b>Level 2 (3–4 marks)</b> Explanation of the role of the jackrabbit's skin in keeping cool <b>OR</b> Explanation how its ears are adapted to increase heat loss <b>OR</b> Description of the role of the jackrabbit's skin in keeping cool and description of how its ears are adapted to increase heat loss.</p> <p><i>There is a line of reasoning presented with some structure. The information presented is relevant and supported by some evidence.</i></p> <p><b>Level 1 (1–2 marks)</b> Description of the role of the jackrabbit's skin in keeping cool <b>OR</b> Description of how its ears are adapted to increase heat loss.</p>	6	<p>3 × 3.2a</p> <p>3 × 2.1</p>	<p><b>AO3 Makes judgements about adaptive features from the image</b></p> <ul style="list-style-type: none"> <li>• has large/long/thin/tall/wide ears.</li> <li>• ears have a large surface area</li> <li>• ears mean the surface area to volume ratio is greater.</li> <li>• ears/skin are highly vascular/lots of blood vessels</li> <li>• blood vessels are very close to the surface of the skin.</li> <li>• thin skin</li> <li>• skin has little/short fur/hair</li> <li>• little/no fur/hair on ears</li> <li>• hair lies flat</li> </ul> <p><b>AO2 Applies knowledge to explain how the adaptations help to regulate body temperature</b></p> <ul style="list-style-type: none"> <li>• vasodilation/blood vessels widen/dilate</li> <li>• increases blood flow at the surface of the skin/to the ears.</li> <li>• more/increased air flow/wind through/around the ears (with large ears/large surface area)</li> <li>• (more heat lost) to environment/by radiation/convection/conduction</li> <li>• (temperature) receptors detect change in temperature</li> </ul>

Question		Answer	Marks	AO element	Guidance
		<p><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><b>0 marks</b></p> <p><i>No response or no response worthy of credit.</i></p>			<ul style="list-style-type: none"> <li>less air/heat trapped (by little hair/fur / hair lies flat)</li> <li>correct ref to negative feedback</li> </ul>
	(b)	<p><b>Any two from:</b></p> <p>Under homeostatic control ✓</p> <p>To allow metabolic/chemical reactions ✓</p> <p>Enzymes to work fast/at their optimum / prevent enzymes denaturing ✓</p> <p>Prevent hypothermia/hyperthermia ✓</p>	<b>2</b>	<b>2 × 2.1</b>	<b>ALLOW</b> for metabolism/respiration

Question		Answer	Marks	AO element	Guidance
21	(a)	Chlorophyll/algae traps/uses/absorb light ✓  (Algae) photosynthesise ✓  Reactants - carbon dioxide and water ✓	3	3 × 2.1	
	(b)	There is a higher concentration (of sugar in the algae) / there is a lower concentration of water in the algae ✓  (Water moves by) osmosis ✓	2	2 × 2.1	<b>ALLOW</b> there is a concentration gradient

Question		Answer	Marks	AO element	Guidance
22	(a)	(missing types of blood vessel) Artery ✓  Capillary ✓  (missing characteristics)  (Vein✗) (capillary✗) ✓	3	3 × 1.1	IGNORE aorta
	(b) (i)	<b>First check the answer on the answer line If answer = 55.6 award 4 marks</b>  (Correct readings from graph) 500 and 400 <b>OR</b> 900 ✓  $\frac{500}{900} \times 100$ ✓  = 55.5555556 ✓  = 55.6 ✓	4	4 × 2.2	<b>ALLOW</b> correct calculation  <b>ALLOW</b> any correct rounding  <b>ALLOW</b> one mark for clear evidence of an incorrect answer correctly rounded to 1 decimal place <b>ALLOW</b> one mark for an answer of 55.5/55 if no other marks awarded
	(ii)	Percentage having TAVR procedure has increased ✓  Less patients develop kidney damage/strokes with TAVR/ORAs ✓  TAVR is safer/less risk/side effects/complications/less dangerous/ORAs ✓	3	3.2a  3.2a  3.2b	<b>ALLOW</b> converse arguments for SAVR  <b>IGNORE</b> quoted figures alone

Question		Answer	Marks	AO element	Guidance
23	(a)	<p>Controls the size of the pupil B</p> <p>Focuses the light on the retina A</p> <p>Transmits electrical impulses to the brain D</p> <p>Detects light C</p> <p>✓✓✓</p>	3	3 × 1.1	<p>ALL correct = 3 marks</p> <p>2 or 3 correct = 2 marks</p> <p>1 correct = 1 mark</p>
	(b) (i)	<p>Student has <u>mild</u> short sightedness/myopia ✓</p> <p>(Glasses/contact lenses) with concave lenses / laser eye surgery ✓</p>	2	2 × 3.2b	
	(ii)	<p><b>First check the answer on the answer line</b></p> <p><b>If answer = 6 (years) award 2 marks</b></p> <p>10 (years with the drug) and/or 4 (years without) ✓</p> <p>= 6 (years) ✓</p>	2	2 × 2.2	

Question		Answer	Marks	AO element	Guidance
24	(a)	(To be able) to see the chromosomes/nucleus/DNA/genetic material/sub-cellular structures/organelles ✓	1	2.2	<b>ALLOW</b> because DNA/chromosomes/genetic material/sub-cellular structures/organelles are colourless/transparent  <b>IGNORE</b> to make structures/cells visible
	(b)	<b>Any four from:</b>  Place (the slide) on the stage/platform ✓  Use low power/magnification (objective lens) ✓  Move the stage / use the (focussing) knob ✓  To <u>focus</u> on the cells ✓  Change to a higher objective lens/higher power/magnification (and refocus) ✓	4	4 × 1.2	<b>ALLOW</b> smallest lens     Only award this marking point if second marking point is awarded
	(c)	<b>First check the answer on the answer line</b> <b>If answer = 90 award 2 marks</b>  120 × 0.75 ✓  =90 ✓	2	2 × 2.1	<b>If no answer on the answer line, then award 2 marks for answer = 90 in table</b>  <b>ALLOW</b> any correct calculation
	(d)	In region C and/or D no cells are dividing/undergoing mitosis /  Cells are only dividing/undergoing mitosis in areas A and B ✓	1	3.1b	<b>ALLOW</b> in region C and/or D there are zero

Question		Answer	Marks	AO element	Guidance
	(e)	<div style="display: flex; flex-direction: column; align-items: flex-start;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Make a more accurate conclusion</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Check that the results are reproducible</div> <div style="margin-top: 20px;">✓✓</div> </div> <div style="display: flex; flex-direction: column; align-items: flex-start; margin-left: 100px;"> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Compare the results with other students' results</div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 5px;">Use a lower magnification so that more cells can be counted</div> <div style="border: 1px solid black; padding: 5px;">Sample from more points in regions <b>A</b> and <b>B</b></div> </div>	<b>2</b>	<b>2 × 3.3b</b>	<b>DO NOT ALLOW</b> more than one line from a box
	(f)	Phloem ✓	<b>1</b>	<b>1.1</b>	

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