



**...day June 20XX – Morning/Afternoon**

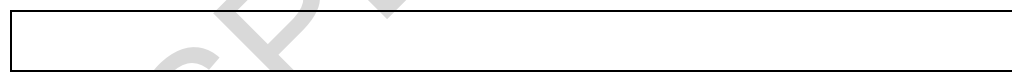
**GCSE (9–1) Biology A (Gateway Science)**

**J247/02 Paper 2 (Foundation Tier)**

**SAMPLE MARK SCHEME**

**Duration:** 1 hour 45 minutes

**MAXIMUM MARK      90**



SPECIMEN

**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. 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

<b>Annotation</b>	<b>Meaning</b>
<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

## 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:

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

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Mark Scheme

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## SECTION A

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



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## SECTION B

Question		Answer	Marks	AO element	Guidance
16	(a)	skin forms a barrier (1)	1	1.1	
		enzymes in tears (1)	1	1.1	
		acid in the stomach (1)	1	1.1	
		acid / enzymes break down microbes (1)	1	1.1	
	(b)	<b>two from:</b> a chemical (usually) made by fungi / microbes (1) that kills (other) microbes / kills bacteria (1) does not destroy viruses (1)	1 1	1.1 1.1	
	(c)	idea that it is a sign of the extent of the disease (1)	1	2.1	
		temperatures far away from normal can be dangerous (1)	1	1.1	
	(d)	(i) structure X is too big to be a virus	1	2.1	<b>ALLOW</b> viruses cannot be seen with a light microscope
		(ii) use an electron microscope (1)	1	1.2	
	(e)	(i) to prevent other people taking in the microbe (1)	1	1.2	<b>allow</b> to prevent other microbes starting to grow/contamination <b>allow</b> to prevent release of the bacteria if the dish is dropped/knocked
		(ii) correct area = $452(\text{mm}^2)$ (3) or correct measurement of diameter to calculate radius (1) correct calculation using calculated radius (2)	3	1.2 2 x 2.2	<b>allow</b> 452.2
		(iii) not resistant (1)	1	3.1b	<b>allow</b> ECF from (ii)

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Question			Answer	Marks	AO element	Guidance	
17	(a)	(i)	a communicable disease	✓	1	2.1	Both correct answers are required for the mark
			a disease that is caused by defective alleles				
			a non-communicable disease				
			a disease that is affected by lifestyle	✓			
		(ii)	antibodies (1)	1	1.1		
		(iii)	idea that it stops blood flowing backwards (1)	1	1.1		
	inefficient circulation to lungs/ less blood would go to the lungs (1)		1	2.1			
	Increased ventilation required for gaseous exchange (1)		1	2.1			
	idea of less oxygen available to the tissues/fatigue/oxygen debt (1)		1	1.1			
	(b)	(i)	7 (years) (1)	1	2.1		
		(ii)	10 years (1)	1	2.1		
			idea of time between two peaks (1)	1	3.2a		
	(c)		kidney (1)	1	1.1		
			higher volume / less concentrated (1)	1	1.1		
18	(a)		Nn / heterozygous (1)	1	2.1		
			0.5 (1)	1	2.2		allow 50% / ½ / 1 in 2 / 50:50
	(b)	(i)	Tim's and Meena's genotypes Nn (1)	1	2.2		
			correct genotypes of offspring (NN, Nn, Nn, nn)	1	2.2		

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Question		Answer	Marks	AO element	Guidance
	(ii)	<p>baby may be nn (1)</p> <p>one in four chance of baby being affected (1)</p> <p>pancreas produces insulin (1)</p> <p>insulin controls blood glucose level (1)</p>	<p>1</p> <p>1</p> <p>1</p> <p>1</p>	<p>2.1</p> <p>3.1b</p> <p>1.1</p> <p>1.1</p>	
19	(a)	all genetically identical / all have the same genes (1)	1	2.1	all clones (1)
	(b)		3	3 x 2.1	
	(c) (i)	<p>Block C was used so the scientists could see if the sticking agent alone killed the fungus (1)</p> <p>Block D was used so the scientists could compare the action of the other treatments with no treatment / as a control (1)</p>	<p>1</p> <p>1</p>	<p>3.1a</p> <p>3.1a</p>	

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Question			Answer	Marks	AO element	Guidance
		(ii)	fungicide and sticking agent were the best at killing fungus (1)	1	3.2b	
			fungicide on its own still killed the fungus (but less than with sticking agent) (1)	1	3.2b	
			sticking agent does kill the fungus (but less than fungicide) (1)	1	3.2b	
20	(a)		producers (1)	1	1.1	
			community (1)	1	1.1	
	(b)	(i)	Set out a grid/sample area (1)	1	1.2	
			use random sampling within that area (1)	1	1.2	

Question	Answer	Marks	AO element	Guidance
(ii)*	<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> <b>Explains improved animal sampling techniques</b> <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> <b>Explains advantages of plants being sedentary along with the limitations of animal sampling using a quadrat</b> <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> <b>Provides a basic description of why sampling has to be used and use of or the limitations of the quadrat</b> <i>The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.</i></p> <p><b>0 marks</b> <i>No response or no response worthy of credit</i></p>	6	3 x 1.2 3 x 3.3b	<p><b>AO3.3b: Analyse the information to develop the techniques to improve the sampling techniques</b></p> <ul style="list-style-type: none"> <li>• use of capture / recapture</li> <li>• use of pitfall traps</li> <li>• use of pooters</li> <li>• plants are sedentary so will not move and as such are easy to count</li> <li>• animals can move away/frightened away</li> <li>• risk of counting animal more than once</li> <li>• missing some animals e.g. burrowing</li> </ul> <p>and</p> <ul style="list-style-type: none"> <li>• further limitations of these methods</li> </ul> <p><b>AO1.2: Demonstrate knowledge of sampling techniques and why sampling is carried out</b></p> <ul style="list-style-type: none"> <li>• a basic description of use of capture/recapture pitfall traps and pooters</li> <li>• gives a basic description as to why sampling techniques are used</li> <li>• the habitat is often too large to count everything</li> <li>• saves time / would take too long otherwise</li> </ul>
(c)	process involves natural selection (1)	1	2.1	
	mice fed on by snakes / owls (1)	1	2.1	
	black mice less likely to get eaten by snakes / owls (1)	1	2.1	

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Question		Answer	Marks	AO element	Guidance
		can pass on the gene for black colour (1)	1	2.1	
21	(a)	mutualism (1)	1	1.1	
	(b)	algae gain protection (1) fungi gain sugars (1)	1 1	2.1 2.1	<b>allow</b> idea about prevention of drying out / absorbing water / minerals
	(c)	larger surface area (to take up pollutants) (1)	1	2.1	<b>allow</b> sticks out more from bark
	(d) (i)	use of random numbers (1)	1	1.2	
	(ii)	40.4 (2)	2	2 x 2.2	<b>allow</b> correct mean ie 9.0 (1)
	(iii)	moderate pollution (1) only just above low / closer to low than high (1)	1 1	3.1a 3.2a	<b>allow</b> ECF from (d) (ii)
	(iv)	identify the species of lichens present in their sample (1) find out how sensitive to pollution these lichens are (1) if the lichens are mostly pollution sensitive species = low pollution levels (1)	1 1 1	3.3b 3.3b 3.3b	<b>allow</b> reference to bushy / crusty  <b>allow</b> ora
22	(a) (i)	the temperature of the heap was the same as the external temperature (1)	1	2.2	
	(ii)	Change in temperature ÷ time  <b>OR</b>  Tangent drawn from line and used to calculate rate	1	2.2	

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Question		Answer	Marks	AO element	Guidance
	<b>(b)</b>	above 60° C the enzymes in the decomposers had denatured (1)	1	1.2	
		below 30° C the enzymes in the decomposers were working too slowly (1)	1	1.2	
	<b>(c)</b>	initially / for the first three times forking reduces the temperature / stops it getting too hot (1)	1	3.1a	
		towards the end forking helps to increase the temperature (1)	1	3.1a	