

...day June 20XX – Morning/Afternoon

GCSE (9–1) Biology B (Twenty First Century Science)

J257/01 Breadth in biology (Foundation Tier)

SAMPLE MARK SCHEME

Duration: 1 hour 45 minutes

MAXIMUM MARK 90

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This document consists of 20 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. 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

11. 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**.

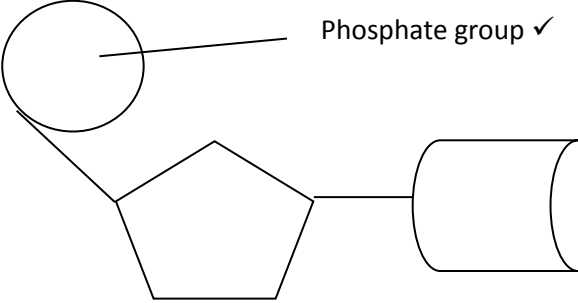

Please ask for help or guidance whenever you need it. Your first point of contact is your Team Leader.

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

	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.

Question		Answer	Marks	AO element	Guidance
1	(a)	Female XX, male XY ✓	1	1.1	Both answers need to be correct for one mark
	(b)	(i) Females $9/15 \times 100 = 60\%$ ✓ Males $6/15 \times 100 = 40\%$ ✓	2	2.2	
		(ii) Any two from Temperatures 30°C and below all males ✓ Temperatures 33°C and above all females ✓ Temperatures in between 30°C and 33°C a mix of male and females ✓	2	3.2b	
	(c)	(i) Amino acids ✓	1	1.1	If more than one box is ticked, do not award the mark even if the correct box is also ticked
		(ii) Add biuret solution ✓ Should turn from blue ✓ To purple if protein present ✓	3	1.2	ALLOW sodium / potassium hydroxide AND copper sulphate solutions

Question		Answer	Marks	AO element	Guidance
	(d) (i)	There will be more collisions between enzymes and substrates so reactions will happen faster ✓	1	2.1	If more than one box is ticked, do not award the mark even if the correct box is also ticked
	(ii)	1. Goes pale ✓ 2. Hairs stand up ✓	2	1.1	MP1 ALLOW description of vasoconstriction
	(iii)	Homeostasis ✓	1	1.1	

Question			Answer	Marks	AO element	Guidance
2	(a)	(i)	 <p>Phosphate group ✓</p>	1	1.1	
		(ii)	GAATCTAG ✓	1	1.1	Label is given next to any structure
	(b)		 <p>cell ✓</p> <p>chromosome ✓</p> <p>DNA ✓</p> <p>GGGATT</p>	3	1.1	If more than one label is given next to any structure, do not award the mark even if the correct label is also given
	(c)	(i)	Chimpanzees ✓	1	2.1	
		(ii)	Cerebral cortex ✓	1	1.1	If more than one box is ticked, do not award the mark even if the correct box is also ticked

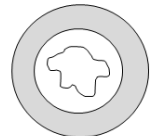
Question		Answer	Marks	AO element	Guidance	
	(d)	(i)	B: 36.36 ✓ C: 92.86 ✓	2	2.2	DO NOT ALLOW answers not given to 2d.p.
		(ii)	Neuron B ✓ Speeds up the time taken for the impulse to travel ✓	2	3.2a 1.1	IGNORE any reference to insulation
	(e)		(3) 1 4 2 ✓✓	2	1.1	1 mark for 4 after 1 1 mark for 2 after 4

SPECIMEN

Question			Answer	Marks	AO element	Guidance
3	(a)	(i)	Cells are joined end to end with no connecting cell walls ✓	1	1.1	If more than one box is ticked, do not award the mark even if the correct box is also ticked.
		(ii)	Any three from Carbon dioxide concentration ✓ As carbon dioxide concentration in air is very low ✓ Temperature will be high ✓ Light intensity will be high ✓	3	3.2a 1.1 × 2	1 mark for identification and 2 marks for explanation ALLOW quoted figures e.g. 0.03%
	(b)	(i)	Less photosynthesis ✓	1	2.1	ALLOW less light absorbed / plant stops growing
		(ii)	Any one from Physical e.g. cuticle / cell wall ✓ Antimicrobial chemicals ✓	1	1.1	
	(c)		Resistant ✓ Offspring ✓ Selective breeding ✓	3	1.1	
	(d)	(i)	ff ✓	1	2.1	If more than one box is ticked, do not award the mark even if the correct box is also ticked

Question		Answer	Marks	AO element	Guidance									
	(ii)	Punnett square correct ✓ <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td></td> <td>F</td> <td>f</td> </tr> <tr> <td>F</td> <td>FF</td> <td>Ff</td> </tr> <tr> <td>f</td> <td>Ff</td> <td>ff</td> </tr> </table> $\frac{1}{4}$ / 0.25 / 25% ✓		F	f	F	FF	Ff	f	Ff	ff	2	2.2	ALLOW fF if given instead of Ff
	F	f												
F	FF	Ff												
f	Ff	ff												

Question		Answer	Marks	AO element	Guidance
4	(a)	As the temperature increases the heart rate increases ✓	1	3.2b	
	(b)	1. Will be difficult to maintain at the correct temperature ✓ 2. Use a thermostatically controlled water bath instead ✓	2	3.3b	MP2 IGNORE 'electronic' or 'electric' water bath
	(c)	They are living organisms, increasing the temperature too high could harm / kill them ✓	1	3.2a	
	(d)	Acts as a pump ✓	1	1.1	
	(e)	Kidneys ✓	1	1.1	If more than one box is ticked, do not award the mark even if the correct box is also ticked
	(f)	They can specialise into other cells ✓ Could be used to treat disease ✓	2	1.1 2.1	
	(g)	Makes ATP ✓	1	1.1	If more than one box is ticked, do not award the mark even if the correct box is also ticked
	(h)	(i) 1. Plots correct +/- half a square ✓ 2. Appropriate scale ✓ 3. Axes correct and labelled ✓	3	1.2	MP3 DO NOT ALLOW axis labels without units
		(ii) Line should be smooth and through all plots ✓	1	2.2	IGNORE extensions to the line beyond the plots
		(iii) 6 ✓	1	3.2a	ALLOW + / - 1 ALLOW an answer + / -1 correctly read from an incorrect plot
		(iv) Do more intermediate temperatures ✓	1	3.3a	DO NOT ALLOW do more temperatures

Question			Answer	Marks	AO element	Guidance
5	(a)	(i)	Any two from Unprotected sex ✓ Sharing used needles ✓ Contaminated blood transfusions ✓	2	1.1	
		(ii)	3, 4, 2, 1 ✓	1	2.1	ALLOW 160, 175, 210, 500
	(b)		Any one from The incidence of the disease has dropped significantly ✓ If the vaccine is shown not to be effective ✓ Reference to cost outweighing benefit ✓	1	2.1	
	(c)		Antibodies ✓	1	1.1	If more than one box is ticked, do not award the mark even if the correct box is also ticked
	(d)	(i)	Risk of death increases with age ✓ Risk is always greater in males ✓	2	3.2b	
	(e)	(i)	Content added to inside of blood vessel ✓ Artery wall of same thickness ✓	2	2.1	 <p>ALLOW 1 mark for a narrowed lumen with no indication of artery wall thickness</p>
		(ii)	Positive ✓	1	2.2	
		(iii)	Is an individual case ✓ Would need a lot of results to see a pattern or trend ✓	2	2.1	

Question			Answer	Marks	AO element	Guidance
6	(a)	(i)	Transports oxygen ✓	1	1.1	ALLOW carries oxygen / carries carbon dioxide / transports carbon dioxide
		(ii)	1. Sarah has fewer red blood cells than normal so less oxygen is transported ✓ 2. So less ATP is produced as there is less respiration ✓ 3. Less ATP would result in Sarah feeling tired ✓	3	2.1	MP2 DO NOT ALLOW "less energy produced"
		(iii)	136 / 90 = 1.5 : 1 ✓	1	2.2	
		(iv)	Increases rate of diffusion of oxygen into cell ✓	1	1.1	
		(v)	A (chemical) messenger ✓	1	1.1	
	(b)	(i)	Any one from Descriptions 1. Person B sugar level falls faster / person A sugar level falls more slowly ✓ 2. Person B sugar level falls back to starting level after just over 2 hours / Person A sugar level remains high ✓ Any one from Reasons why 3. Person A does not respond to the hormone / insulin produced to convert sugar to glycogen ✓ 4. Person B produces a hormone / insulin in response to the rise in blood sugar and this causes cells to convert the sugar to glycogen so the level falls ✓	2	3.1a 2.1	Max 1 for description and max 1 for the reason why MPs 3 and 4 DO NOT ALLOW a reference to hormone response or lack of response without reference to the role of insulin.

Question	Answer	Marks	AO element	Guidance
(ii)	<pre> graph LR A[Type 1 diabetes] --- B[body no longer responds to the insulin produced] A --- C[should eat a diet high in complex carbohydrates and exercise] A --- D[will need to inject insulin] A --- E[pancreas stops producing insulin] </pre>	2	1.1	Award one mark for each correct line. However, if more than 2 lines are drawn, delete one mark for each incorrect line

SPECIMEN

Question		Answer	Marks	AO element	Guidance	
7	(a)	<p>Any three from Use a line transect AND quadrat ✓ Running from the sea up the shore ✓ To take many samples ✓ Repeat at different parts of the shore ✓</p>	3	2.2		
	(b)	(i)	8 ✓	1	3.1a	
		(ii)	<p>FIRST CHECK THE ANSWER ON THE ANSWER LINE IF answer = 47 award 2 marks</p> <p>$(45 + 47 + 49) / 3$ ✓ 47 ✓</p>	2	2.2	
	(c)	<p>Limpets will decrease in numbers ✓ As more are eaten ✓ OR Crabs will increase in numbers ✓ As more food ✓</p>	2	3.1a 2.1	ALLOW any correct species with correct explanation	
	(d)	<p>Any two from 1. Idea of interdependence ✓ 2. Example of interdependence e.g. food / shelter / reproduction ✓ 3. Maintaining genetic diversity ✓ 4. May be required in the future for medicines ✓ 5. Maintains the stability of the food web ✓</p>	2	1.1	MP3 IGNORE 'genetic variation'	

Question		Answer	Marks	AO element	Guidance	
	(e)	1. Advantage: (can be) fast / no need to find a mate ✓ 2. Disadvantage: lack of genetic diversity / are all genetically identical ✓	2	1.1	MP2 ALLOW 'are clones' DO NOT ALLOW 'are all identical'	
	(f)	(i)	Enzymes will become denatured ✓	1	2.1	If more than one box is ticked, do not award the mark even if the correct box is also ticked
		(ii)	Some cells may burst ✓	1	2.1	If more than one box is ticked, do not award the mark even if the correct box is also ticked