UNIT 1: (Double Award) BIOLOGY 1
HIGHER TIER

MARK SCHEME

GENERAL INSTRUCTIONS

Recording of marks

Examiners must mark in red ink.

One tick must equate to one mark (apart from the questions where a level of response mark scheme is applied).

Question totals should be written in the box at the end of the question.

Question totals should be entered onto the grid on the front cover and these should be added to give the script total for each candidate.

Marking rules

All work should be seen to have been marked.

Marking schemes will indicate when explicit working is deemed to be a necessary part of a correct answer.

Crossed out responses not replaced should be marked.

Credit will be given for correct and relevant alternative responses which are not recorded in the mark scheme.

Extended response question

A level of response mark scheme is used. Before applying the mark scheme please read through the whole answer from start to finish. Firstly, decide which level descriptor matches best with the candidate's response: remember that you should be considering the overall quality of the response. Then decide which mark to award within the level. Award the higher mark in the level if there is a good match with both the content statements and the communication statements.

Marking abbreviations

The following may be used in marking schemes or in the marking of scripts to indicate reasons for the marks awarded.

cao = correct answer only
ecf = error carried forward
bod = benefit of doubt

<table>
<tr><th colspan="4" rowspan="2">Question</th><th rowspan="2">Marking details</th><th colspan="6">Marks available</th></tr>
<tr><th>AO1</th><th>AO2</th><th>AO3</th><th>Total</th><th>Maths</th><th>Prac</th></tr>
<tr><td>1</td><td>(a)</td><td>(i)</td><td></td><td>6 correct (2)
3 correct (1)

<table><tr><td>1</td><td><u>true</u></td><td>false</td></tr><tr><td>2</td><td><u>true</u></td><td>false</td></tr><tr><td>3</td><td>true</td><td><u>false</u></td></tr><tr><td>4</td><td><u>true</u></td><td>false</td></tr><tr><td>5</td><td><u>true</u></td><td>false</td></tr><tr><td>6</td><td>true</td><td><u>false</u></td></tr></table></td><td></td><td>2</td><td></td><td>2</td><td></td><td></td></tr>
<tr><td></td><td></td><td>(ii)</td><td></td><td>More accurate reflection/closer to the mean/counter variability (1)
Confirm that the conclusions are common to all (genetic) groups/spot possible (genetic) differences between groups(1)</td><td>2</td><td></td><td></td><td>2</td><td></td><td>2</td></tr>
<tr><td></td><td></td><td>(iii)</td><td></td><td>Any 3 × (1) from:
stroke/thrombosis
type 2 diabetes
tooth decay
mobility issues</td><td>3</td><td></td><td></td><td>3</td><td></td><td></td></tr>
<tr><td></td><td></td><td>(iv)</td><td></td><td>How much fat/ sugar (1)
Is in each portion/ 100 g/ packet (1)</td><td></td><td>2</td><td></td><td>2</td><td></td><td></td></tr>
</table>

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
1		(v)	I	Apples		1		1		
			II	Flavonol **and** flavonone		1		1		
	(b)			Good range/variety/all the nutrient groups (1) {Volume/ mass/ in proportion} to appropriate for age/gender/activity (1)	2			2		
	(c)			For: to reduce consumption of sugary foods/drinks (1) Against: interference on individual choice/the market (1)		2		2		
				Question 1 total	**7**	**8**	**0**	**15**	**0**	**2**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
2	(a)	(i)		304		1		1	1	
		(ii)		Lowri – <u>smallest/least</u> peak flow		1		1	1	
		(iii)		Excess mucus/tar **and** Restricts volume/ability to force air out (1) accept similar argument for emphysema, bronchitis, lung cancer	1			1		
	(b)			intercostal muscles relaxes and ribcage moves down and in (1) diaphragm relaxes and domes (1) reducing volume of thorax (1) {increasing internal air pressure/ greater pressure in than out}, so air forced out (1)	4			4		
				Question 2 total	**5**	**2**	**0**	**7**	**2**	**0**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
3	(a)			lock and key	1			1		
	(b)			substrate molecule fits/binds to active site (1) so reaction occurs (1) products are formed (1)	3			3		
	(c)			active site denatured/destroyed (1) substrate cannot fit (1) no reaction (1)		3		3		
	(d)			no reaction (1) substrate Q does not fit active site (1)			2	2		
				Question 3 total	**4**	**3**	**2**	**9**	**0**	**0**

Question				Marking details	Marks available					
					AO1	AO2	AO3	Total	Maths	Prac
4	(a)			A = vena cava **and** B = right atrium	1			1		
	(b)			arrow(s) entering pulmonary vein, descending to l. ventricle and out through aorta	1			1		
	(c)			no oxygen/no glucose (1) no respiration (1) no contraction (1)	3			3		
				Question 4 total	**5**	**0**	**0**	**5**	**0**	**0**

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
5	(a)			carbon dioxide + water ➔ glucose	1			1		
	(b)			***Indicative content*** Use low light intensity measure volume /count bubbles over a set period of time at least two controlled variables stated increase light intensity and repeat suitable method to increase light (move lamp/ change brightness of bulb) range of five light intensities plot results/compare **5 – 6 marks** : Detailed description of the entire investigation to include repeats and fair testing. *There is a sustained line of reasoning which is coherent, relevant, substantiated and logically structured. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.* **3 – 4 marks** : Outline general description of the investigation *There is a line of reasoning which is partially coherent, largely relevant, supported by some evidence and with some structure. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.* **1 – 2 marks** : Reference only to counting bubbles/measuring volume at different light intensities *There is a basic line of reasoning which is not coherent, largely irrelevant, supported by limited evidence and with very little structure. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.* **0 marks:** *No attempt made or no response worthy of credit.*			6	6		6

	(c)	(i)		temperature; increasing the temperature results in increased rate of p/s;			2	2	1	
		(ii)		carbon dioxide; rate faster at the higher concentration;			2	2	1	
				Question 5 total	**1**	**0**	**10**	**11**	**2**	**6**

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
6	(a)	(i)		130		1		1	1	
		(ii)		130/2500 x 100 (1) 5.2 (1)		2		2	2	
	(b)			restrict movement (1) maintain constant (high) temperature in building (1)		2		2		
				Question 6 total	**0**	**5**	**0**	**5**	**3**	**0**

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
7	(a)			As oxygen concentration increases, the rate of heavy metal uptake increases (1) This shows that respiration is involved (1) Producing more energy/ more ATP released (1) And therefore more active uptake (1)		4		4	1	
	(b)			**Any 2 (x1) from:** reduce losses from pests/herbivores control oxygen level optimum water/nutrients more convenient for sampling		2		2		2
	(c)			passes up food chain (1) toxic levels in carnivores (1)	2			2		
				Question 7 total	**2**	**6**	**0**	**8**	**1**	**2**

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SUMMARY OF MARKS ALLOCATED TO ASSESSMENT OBJECTIVES

Question	AO1	AO2	AO3	TOTAL MARK	MATHS	PRAC
1	7	8	0	15	0	2
2	5	2	0	7	2	0
3	4	3	2	9	0	0
4	5	0	0	5	0	0
5	1	0	10	11	2	6
6	0	5	0	5	3	0
7	2	6	0	8	1	2
TOTAL	24	24	12	60	8	10