

**UNIT 4: (Double Award) BIOLOGY 2
FOUNDATION 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

Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
1	(a)			A Hair (1) B Sweat pore (1) C Erector muscle (1) D Sweat gland (1)	4			4		
	(b)			Dilate (1) More (1) More (1) Radiation (1)	4			4		
				Question 1 total	8	0	0	8	0	0

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Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
2	(a)			Both daughter cells contain the same 6 chromosomes as the mother cell		1		1		
	(b)			{Growth/replacement} of damaged cells/repair of damaged <u>tissues</u>	1			1		
	(c)			Any 2 x (1) from: Daughter cells have half the chromosomes of the mother cells/have haploid number Meiosis results in 4 daughter cells Cells produced by meiosis become gametes/sex cells Genetically different to each other	2			2		
				Question 2 total	3	1	0	4	0	0

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Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
3	(a)			Double helix	1			1		
	(b)	(i)		All Pairs drawn correctly (2) 3 pairs drawn correctly (1)		2		2		
		(ii)		resolving paternity cases/ criminal cases/ classification	1			1		
				Question 3 total	2	2	0	4	0	0

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Question			Marking details	Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
4	(a)	(i)	A receptor cell(s) B sensory neurone	2			2		
		(ii)	Any 2 x (1) from: Touch Temperature Chemicals	1			1		
	(b)	(i)	$(0.296 + 0.274 + 0.279)/3$ (1) 0.283 (1)		2		2	2	1
		(ii)	So that the test subject could not anticipate when the green light would come on		1		1		1
		(iii)	I Because Mike is older than Liz and has a faster mean reaction time [ORA]			1	1		1
			II Any 3 x (1) from: Increase the number of both males and females Same age/ health Increase the number of tests/ repeatability Reproduceability			3	3		3
			Question 4 total	3	3	4	10	2	6

Question			Marking details		Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
5	(a)	(i)		Arctic fox lives at high latitudes/furthest north and has largest body (1) Fennec fox lives at low latitudes/least furthest north and has smallest body (1) Red fox live in middle latitudes/mid-north and has medium sized body (1)		3		3		
		(ii)	I	smaller the body mass the more heat is lost		1		1		
			II	blends in with white environment/snow/ camouflage from prey/predator		1		1		
			(iii)		larger the ears the more heat they lose		1		1	
	(b)			the genus/generic name/ <i>Vulpes</i>		1		1		
	(c)			because scientific names are {the same in all languages/universal/all around the world/countries}/ because common names differ in different languages/different parts of the world/countries	1			1		
				Question 5 total	1	7	0	8	0	0

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Question				Marking details	Marks Available					
					AO1	AO2	AO3	Total	Maths	Prac
6	(a)			Place the quadrats randomly	1			1		1
	(b)			Place the quadrat (randomly) and count the number of poppies (1) Repeat (10 times) (1) Calculate the mean number of poppies (in the 10 samples) (1) Use the mean to calculate the number of poppies in the area of waste ground (1)			4	4		4
				Question 6 total	1	0	4	5	0	5

Question		Marking details	Marks Available					
			AO1	AO2	AO3	Total	Maths	Prac
7	(a)	<p>Indicative content:</p> <ul style="list-style-type: none"> • Skin forms a barrier against the entry of pathogens • If skin is cut blood clots to seal the wound • Phagocytes • ingest pathogens • Lymphocytes produce • antibodies which destroy antigens • and antitoxins which neutralize toxins produce by antigens <p>5 – 6 marks: Detailed description of defence including correct reference to skin, phagocytes, lymphocytes, antibodies and antitoxins. <i>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.</i></p> <p>3 – 4 marks: A description of the role of skin, phagocytes and lymphocytes. <i>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.</i></p> <p>1-2 marks: A basic description of role of skin or white blood cells. <i>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.</i></p> <p>0 marks: No attempt made or no response worthy of credit.</p>	6			6		
		Question 7 total	6	0	0	6	0	0

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Question		Marking details		Marks Available					
				AO1	AO2	AO3	Total	Maths	Prac
8	(a)		<p>Any 2 x (1) from: (explanation must link to symptom given) <i>Symptom</i> – constant thirst (no mark) <i>Explanation</i> – ref to body having to lose a lot of water excreting glucose</p> <p><i>Symptom</i> – excessive urination (no mark) <i>Explanation</i> – ref to body having excess glucose to excrete which cannot be done unless dissolved in water</p> <p><i>Symptom</i> – loss of weight (no mark) <i>Explanation</i> – body can't use the glucose it gets from food as a source of energy therefore fat stores are used</p>		2		2		
	(b)	(i)	Increases (1) Pancreas (1) recognizes increase in glucose in blood and secretes insulin (1)			3	3	1	
		(ii)	{No/ very low} insulin would be recorded			1	1		
			Question 8 total	0	2	4	6	1	0

Question				Marking details		Marks Available														
						AO1	AO2	AO3	Total	Maths	Prac									
9	(a)			Carbohydrate (1) excess of which is converted to glycogen (1)			2		2											
	(b)	(i)		of the 149 horses tested 62.0% had PSSM1gene			1		1											
		(ii)	I	0.9			1		1	1										
			II	1			1		1	1										
		(iii)		Clydesdale + Shire + Belgian			1		1											
	(c)	(i)		<table border="1" style="margin-left: auto; margin-right: auto;"> <tbody> <tr> <td></td> <td>B</td> <td>b</td> </tr> <tr> <td>b</td> <td>Bb</td> <td>bb</td> </tr> <tr> <td>b</td> <td>Bb</td> <td>bb</td> </tr> </tbody> </table> <p>Gametes correct (1) Cross correct (1)</p>			B	b	b	Bb	bb	b	Bb	bb		2		2		
	B	b																		
b	Bb	bb																		
b	Bb	bb																		
		(ii)		1 : 1			1		1	1										
				Question 9 total		0	9	0	9	3	0									

FOUNDATION TIER

SUMMARY OF MARKS ALLOCATED TO ASSESSMENT OBJECTIVES

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