

Question	Marking details	Marks Available
8/1 (a)	(i) Pike	1
	(ii) Pyramid correctly drawn (accept triangle) with correct labels and biomasses with units = 2 marks Pyramid correctly drawn with names of organisms on own without masses = 1 mark Pyramid correctly drawn with biomasses on own with units without named organisms = 1 mark Incorrect order or level missing = 0 marks	2
	<p style="text-align: center;"> <div style="border: 1px solid black; width: 100px; height: 30px; margin: 0 auto; display: flex; align-items: center; justify-content: center;">Pike 250 kg</div> <div style="border: 1px solid black; width: 200px; height: 40px; margin: 5px auto; display: flex; align-items: center; justify-content: center;">Minnows 500 kg</div> <div style="border: 1px solid black; width: 300px; height: 40px; margin: 5px auto; display: flex; align-items: center; justify-content: center;">Beetles 800 kg</div> <div style="border: 1px solid black; width: 400px; height: 40px; margin: 5px auto; display: flex; align-items: center; justify-content: center;">Snails 4 500 kg</div> <div style="border: 1px solid black; width: 500px; height: 40px; margin: 5px auto; display: flex; align-items: center; justify-content: center;">Aquatic Plants 45 000 kg</div> </p>	
	(iii) Tier above the pike;	1
(b)	{Single/one} {plant/ tree / named plant/ producer}; NOT aquatic plant On which {many organisms/ named organisms} {feed/ live off};	2
	Question 8/1 total	[6]

Question	Marking details	Marks Available
9/2 (a)	(i) The cows are <u>genetically</u> different/have different <u>genes</u> / show <u>genetic</u> variation/ different ages/ variation in the milk producing genes; NOT different genetics/ sizes/ inherited it from their parents/ mutation	1
	(ii) River field cows' milk production is higher/ ORA; there are <u>environmental</u> differences/ named environmental difference e.g. temperature/soil/nutrients/water content/ {richer/better <u>quality</u> } grass (must be comparative); 2 nd mark only awarded if 1 st is credited	2
	(iii) Sperm (are used)/ two parents/ bull and cow;	1
(b)	Holstein; it has the { <u>lowest/least</u> } fat content/ lower fat than the other cows; 2 nd mark point only accessed if first correct sugar=neutral	2
Question 9/2 Total		[6]

Question	Marking details	Marks Available
10/3	(a) <u>Erector muscle</u> ;	1
	(b) <ol style="list-style-type: none"> 1. Hairs {erect/raised/ stand up/ stick up/ are lifted/ pulled up/ straight up/ up}; 2. Trap <u>thicker</u> layer of air/ more air trapped; NOT trap layer of warm air (can be neutral) 3. Which is {an insulator/ poor conductor} / which lets less heat pass out/ which insulates/ harder for heat to escape; NOT no heat passes out <p>3rd mark only awarded if 2nd awarded</p> <p>ACCEPT REVERSE ARGUMENT</p>	3
	(c) Any two from: <ol style="list-style-type: none"> 1. Vasoconstriction/ {capillaries/ blood vessels} {narrow/ constrict/ thinner}/ diameter gets smaller; NOT contract/ get smaller/ blood vessels moving up and/or down 2. shivering; {reduced/ no} sweating/ less sweat {produced/ secreted}; 	2
	Question10/3 Total	[6]

Question	Marking details	Marks Available
11/4	<p><i>Indicative content:</i></p> <p>All plants/seedlings/flowers are growing vertically straight up.</p> <p>{Place plants on a window sill/ in a (blacked out) box with a hole in one side/ any method of one sided illumination}.</p> <p>Leave plants for specified length of time.</p> <p>Plants show growth towards light/ tips 'bend' towards light. NOT move</p> <p>Reference to involvement of hormone e.g. hormone cause shoots to bend.</p> <p>Reference to control by eliminating the effect of one sided light. This should be uniform illumination. NOT darkness</p> <p>Shoots/tips don't bend towards light.</p> <p>5 – 6 marks The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</p> <p>3 – 4 marks The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</p> <p>1 – 2 marks The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</p> <p>0 marks The candidate does not make any attempt or give a relevant answer worthy of credit.</p> <p>Question 11/4 Total</p>	6
		[6]

Question	Marking details	Marks Available
5 (a)	All correct 1 mark Mouse 1 BB - black Mouse 2 Bb - black Mouse 3 bB - black Mouse 4 bb - red	1

- (b) (i) 12; 1
- (ii) All correct no errors 1

Gametes	B	B
b	Bb	Bb
b	Bb	Bb

- (c) (i) 25; 1
- (ii) All correct no errors 1

Gametes	B	b
b	Bb	bb
b	Bb	bb

- (d) Fertilization is random/ reference to death of embryos; 1

Question 5 Total [6]

Question	Marking details	Marks Available
6 (a)	$(88/88\ 000) \times 100$; 0.1%; Correct answer = 2 marks	2
(b)	Accumulation of pesticides/ bioaccumulation/ increase in concentration of pesticide; Can reduce fertility/ makes them infertile/ reduce reproductive rate; NOT kills fish before they can reproduce/ less eggs fertilised 2 nd mark only awarded if 1 st awarded	2
Question 6 total		[4]

Question	Marking details	Marks Available
7 (a)	Hormone = insulin in both boxes ;	2
	Organ = pancreas;	1
	Increase = glucose;	1
	Decrease = glucose;	1
(b)	Any two from Chemical messengers; Carried in blood; Controls {body/a} {function/process}; (Insulin) decreases glucose in the blood; Hormones produced by {pancreas/ glands};	2
Question 7 total		[7]

Question	Marking details	Marks Available
8	(a) (i) Nn;	1
	(ii) Nn;	1
	(b) 50(%)	1
	(c) (i) {Genetic/ DNA} {profile/ profiling}; NOT genetic fingerprinting	1
	(ii) DNA {has coded information/ codes for protein}; Baby's DNA is different to Mike's/ In the {DNA profiles/ genetic analysis} above, the baby {does not have any (base) A/ has one less G};	2
	(d) Family tree only shows the <u>{chance/probability}</u> of having CF; {Profile/ analysis/it} shows the (presence of) {alleles/mutation/gene}; NOT the genotype	2
Question 8 Total		[8]

Question	Marking details	Marks Available
9 (a)	(i) <u>More</u> {rainfall/ precipitation} therefore <u>more</u> {slurry/nitrates/manure} could be washed into water;	1
	(ii) <u>{More/ faster}</u> absorption of nitrates (as plants are growing); NOT Less rainfall in spring	1
(b)	{Herbicide/ pest/ fungus/ drought/ low temperature/ disease} resistance/ increase rate of photosynthesis/ any correct point; NOT pesticide resistance/ immune to herbicides/ increased yield	1
(c)	Protein converted to ammonia/ Ammonia is converted to nitrate; By decomposers/ bacteria/ fungi; If named, bacteria must be correct. e.g. Nitrifying bacteria change protein to ammonia = 1 mark	2
Question 9 Total		[5]

Question	Marking details	Marks Available
10	<p>Indicative content</p> <p>A gene mutates. This resulted in variation. The variation reduced water loss. This {was an advantage/ had survival value} (in the desert.) Resulted in natural selection/ survival of the fittest to breed (Advantageous altered) gene was passed on.</p> <p>5 – 6 marks The candidate constructs an articulate, integrated account correctly linking relevant points, such as those in the indicative content, which shows sequential reasoning. The answer fully addresses the question with no irrelevant inclusions or significant omissions. The candidate uses appropriate scientific terminology and accurate spelling, punctuation and grammar.</p> <p>3 – 4 marks The candidate constructs an account correctly linking some relevant points, such as those in the indicative content, showing some reasoning. The answer addresses the question with some omissions. The candidate uses mainly appropriate scientific terminology and some accurate spelling, punctuation and grammar.</p> <p>1 – 2 marks The candidate makes some relevant points, such as those in the indicative content, showing limited reasoning. The answer addresses the question with significant omissions. The candidate uses limited scientific terminology and inaccuracies in spelling, punctuation and grammar.</p> <p>0 marks The candidate does not make any attempt or give a relevant answer worthy of credit.</p> <p>Question 10 Total</p>	6
		[6]