

WJEC (Wales) Biology GCSE
Topic 2.1 Classification and
Biodiversity
Questions by Topic - Mark
Scheme

1.

Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept	
(a)		3	insect • hedgehog • moss • bacterium • all 4 correct = 3 marks;;; 2/3 correct = 2 marks;; 1 correct = 1 mark;	non-flowering plant invertebrate microorganism vertebrate			
(b)		1	<u>flowering plants</u> ;				
Total Mark		4					

2.

Question	Marking details	Marks Available
(a)	Backbone/vertebrae/bones/spine (NOT spinal cord);	1
(b)	(i) <u>Genus</u> ;	1
	(ii) <u>Species</u> ;	1
(d)	(i) I {percentage/ %} <u>dark</u> sheep;	1
	II correct plotting +/- 1/2 small square;;	2
	III <u>straight</u> line joining the plots;	1
	(ii) I as temperature rises the {%/ proportion} <u>dark</u> sheep falls; (NOT {number/ amount} of sheep/reverse argument)	1
	II Any two from: (differential) predation/camouflage; disease; food; water; correct genetic reason; NOT different genes (NOT hunting)	max 2

3.

Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(a)	2	One mark for correct whales: Sperm (whale), humpback (whale), killer (whale); Accept latin names if correct Different genus/ genera;			species
(b)	1	<i>Balaenoptera</i> ;			
	1	Highest similarity of DNA when compared to fin whale/ higher similarity than in the killer and sperm whales; Accept correct reference to comparative data			
c	1	You are using a bigger sample/ more codes/ more information/ more data;			
Total Mark	5				

4.	Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
	(a) i	4	<p>one mark for correct adaptation plus one for a correct explanation.</p> <p>any two from:</p> <ul style="list-style-type: none"> • <u>thick</u> hair; good insulator/ reduces heat loss; • <u>black</u> coat colour; {absorbs/takes in} heat ; • <u>small</u> ears; <u>reduced surface area</u> for heat loss; 	<p>Keeps <u>more</u> heat in</p> <p>solar energy /sun's <u>energy</u></p>		<p>Keeps heat in/ keeps it warm</p> <p>Attracts heat</p>
	ii	1	it has finger like ends on the trunk;			

5.	Question	Marking details	Marks Available
	(b)	<p>(Decrease)</p> <p>loss of (animal) <u>species/ species</u> becoming extinct/ less or fewer <u>species</u>;</p> <p>Reject animals haven't got enough food/ numbers decreasing/ species will die/ not enough food to feed all the species</p> <p>Reject type instead of species</p>	1

6.	Question	Marking details	Marks Available
	(a) (i)	Description must include <u>DNA / RNA/ genetic material/ genes/</u>	2
	(c)	Biological control/ biocontrol;	1

7.	Question	Marking details	Marks Available
	(a)	(i) Any two for one mark Disease; Pests/fungus/mould; Climate change; <i>NOT pod rot</i>	1
	(c)	(ii) Biological control/ biocontrol;	1
	(d)	(i) Fewer rotted pods than untreated; Answer must be comparative	1
		(ii) Does not affect other organisms/ does not damage biodiversity;	1

8.	Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
	(a)	2	$\frac{(750\,000 - 500\,000)}{500\,000} \times 100 = 50\%$ Correct answer = 2 marks Method correct with incorrect answer = 1			
	(b)	(i)	1	(Number / population) <u>increasing</u>		Reference to only one type of bat
		(ii)	I	1	(Greater) Horseshoe (bat)	allow ecf from table
			II	1	(Common) Pipistrelle	
	(e)	2	Species becomes extinct / loss of species; (Loss of a species give) reduced biodiversity;		endangered	

9.	Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
	(a)	2	Any two from: <ul style="list-style-type: none"> Pesticide becomes {diluted/ less concentrated}/ pesticide has to be added every two weeks; does not kill all fish lice; pesticide kills the lice if above 2.5 concentration ; 			
	(b)	(i)	1	biological / biocontrol;		bio

10.

Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(b)	2	<p>Area of rocky shore = $20 \times 20 = 400 \text{ (m}^2\text{)}$ Area of quadrat = $0.5 \text{ m} \times 0.5 \text{ m} = 0.25 \text{ m}^2$ 4 quadrats to the square metre 1600 quadrats cover whole area</p> <p>2% of 1600 = 32 quadrats = 2 marks</p> <p>If answer incorrect award 1 mark for any one of:</p> <ul style="list-style-type: none"> recognising area of sample area = $400 \text{ (m}^2\text{)}$ for recognising 4 quadrats to the square metre Area of quadrat = 0.25 $1600 \times \frac{2}{100}$ 			
(c)	1	<p>{If half/ more than half/ most/ the majority} of the {specimen/ flower/ barnacle/ object/ organism} is in the quadrat it can be counted/if less than half the specimen is in the quadrat do not count it;</p>			plural/ reference to species

11.		Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(a)	(i)		1	Any one (x1) from Immigration/ owtte; Emigration/ owtte; Predation; Not enough samples taken; Not enough time to allow mixing of populations;	ref. to marking method affecting survival/recapture		Reference to reproduction/ death unqualified
	(ii)		1	Repeat the procedure/ take larger samples/ give more time for mixing of populations;	ref to inconspicuous marking technique/ material		Reference to other orchards
(b)	(i)		1	Biological control/ biocontrol;			
(c)			2	ADVANTAGE Any one (x1) from: <ul style="list-style-type: none"> • specific • no bioaccumulation/environmental contamination/ chemicals do not enter food chain • less frequent re-application • no problems with resistance DISADVANTAGE Any one (x1) from: <ul style="list-style-type: none"> • become a pest themselves • Does not eradicate pest • takes longer to establish • Could carry disease 			IMMUNITY

12.		Question	Marking details	Marks Available
(a)			Place the quadrats randomly within the sample area;	1
(b)	(i)		Mean = 6.2;	1
	(ii)		Estimated no of lugworms = 6.2×3200 ; = 19 840; Allow ECF from (b)(i) (If answer is correct award 2 marks directly)	2
(c)			Any ref to evidence not available on surface (to count)/hidden by grass/ {casts/holes/burrows} are <u>hidden by the grass</u> / earthworms move/ earthworms do not stay in one burrow/ Accept ref to 3D aspect of population of earthworms ie there can be many earthworms at the same vertical point in the soil;	1
Question 12 total				[5]

13.

Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(b)	2	(2/25) x 100 = 8% Method; Answer; Correct answer on its own = 2			
(c)	2	There is less light/ water/ minerals/ ions/ nutrients; Because of <u>more/ most</u> competition from the parent population;			Parent plant takes all (named resource) space

14.

Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(a)	1	3;	3 per m ² 3/m ² 3 m ⁻²		3m ²
(b)	1	540m ² ; unit needed			
(c)	1	1620; allow ecf from (a) and (b)			
(d)	1	29.6; allow ecf from (c)	30		
(e)	1	Any one from: <ul style="list-style-type: none"> increase {number/ area/ size} of quadrats/ repeat investigation / do two separate studies – one of shaded area and one in the full sunlight area; 	Use a bigger sample size/ throw quadrat more often	Throw the quadrat more	Use transects
Total Mark	5				

15.

Question	Marking details	Marks Available
15 (a)	$\frac{200 \times 200}{20}$; Answer = 2000; 2 marks for correct answer	2
(b)	20/ number recaptured;	1

16.	Question	Marking details	Marks Available
(a)	(i)	$P = \frac{56 \times 48}{16} = 168;$ Method (1) Answer (1)	2
(b)		Repeat the exercise/ take {more/ larger} samples; NOT take larger sample area.	1
(c)			
(d)		Could eat them/ could be predators; Could compete for food/ eat their food/ compete for <u>breeding</u> space; Could introduce disease; (in fact <i>Astacus fluviatilis</i> , the American red clawed crayfish, has introduced a fungal parasite)	3

Questions Total: 77

17.	Question	Marking details	Marks available					
			AO1	AO2	AO3	Total	Maths	Prac
(a)		39 = 2 marks 39.1 = 1 mark if answer is incorrect award 1 mark for correct method: $23 \times 17 \div 10 = 1$ mark for method		2		2	2	2
(b)		sampled each area once on the first day and once on the second day/ sampled each area early in morning/ sampled each area on damp day/ allowed {one week/ time} to allow marked snails to mix with the rest of the population		1		1		1
(c)		<ul style="list-style-type: none"> (Number of song thrushes increased because) white ink spot made the snails {more conspicuous/ less camouflaged/ more visible} / OWTTE (1) use ink which blends in with the background colour of snail/ make markings less obvious/ mark snail on underside (1) 			2	2		2
		Question 17 total	0	3	2	5	2	5

18. Question			Marking details	Marks available					
				AO1	AO2	AO3	Total	Maths	Prac
(a)	(i)		B		1		1		
	(ii)		(biodiversity) reduce and Other species do not survive/killed/out-competed		1		1		
(b)	(i)		Biological control/biocontrol	1			1		
	(ii)		Correct answer = 10 (m) = 2 marks If incorrect allow 0.6 x 25 =15 (1)		2		2	2	
(c)	(i)		Any one (x1) from (louse) does not affect any other (non-target) species Reproduces well in summer (when needed)		1		1		
	(ii)		By other scientists undertaking the same investigation/ comparing with other scientists		1		1		1
Question 18 total				1	6	0	7	2	1

19. Question		Marking details	Marks Available
19	(a)	Biological (control); Accept bio control	1
	(b)		
	(ii)	Reduces/decreases;	1
	(iii)	August – <u>greatest</u> difference in number/OWTTE;	1
(c)	(i)	Check whether it {affects/causes} {disease/damage} to <u>other organisms/ tomatoes</u> / does not become a pest itself; NOT disease unqualified/causes disease to humans	1

20.	Question		Marking details	Marks Available
		(c)	They use the same name of genus and species/same {scientific/universal/Latin/international/binomial} name/scientific name is universal;	1

21.	Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
	(a)	(i)	1	genus / <u>common</u> / species name;		
		(ii)	1	<u>genus</u> / common / species name;		
		(iii)	1	genus / common / <u>species</u> name;		
	(b)	(i)	1	allows a lot of/more heat to escape;	Increased heat loss	

22.	Question		Marking details	Marks available						
				AO1	AO2	AO3	Total	Maths	Prac	
	22	(a)	(i)	Mammals (1) <u>Lepus</u> (1) <u>arcticus</u> (1) spelling of latin must be correct	2	1		3		
			(ii)	unique/ universal/ always the same or equivalent wording/ avoid confusion Accept common names are different in different {countries/ languages} Reject easier for scientists	1			1		
		(b)	(i)	False/ × True/ ✓ True/ ✓ False/ × 4 correct = 3 marks 3 correct = 2 mark 2 correct = 1 marks 0/1 correct = 0 marks		3		3		
		(c)		(Thick fur –) to reduce heat loss/ keeping warm/ traps heat/ insulation (1) (White –)cannot be seen / idea of camouflage(1) 'blends in' neutral Reference to fat is neutral		2		2		
				Question 22 total	3	8	0	11	0	0

23.	Question	Marking details	Marks Available
	(b)	4.5; 3.2;	[2]
	(c)	Any two from: Competition for/ shortage of/ less/ running out of: nutrients/ minerals; space/ room; carbon dioxide;	[2]

24.	Question		Marking details	Marks Available
	24	(a)	$655 - 280 = 375$ $\frac{375}{655} \times 100 =$ $= 57.25 / 57.3\%$ NOT 57.0/57 Correct answer = 2 marks Allow 1 mark for correct working but incorrect answer	2
		(b)	(i) Flatworms compete with hedgehogs for {food/ invertebrates}; Therefore hedgehogs eat <u>more</u> birds' eggs (avoiding the competition); (must be linked for second mark)	2

25.	Question		Marking details	Marks Available
	25	(a)	(i) extinct in the wild/ extinct;	1
			(ii) It will be {reduced/lower/smaller}/ there will be fewer species/less diverse;	1

26.

Question			Marking details	Marks available					
				AO1	AO2	AO3	Total	Maths	Prac
	(a)	(i)	(An invasive species is) {a species/ it is} not native to a location (1) It can spread uncontrollably/ cause damage to the {environment/economy}/ outcompete native species/ cause disease(1)	2			2		
		(ii)	<i>Dikerogammarus (villosus)</i>		1		1		
		(iii)	It will be reduced		1		1		
	(b)	(i)	via/along the Ludwig Canal in {1992/1993/between 1992 & 1993} 1 mark for both answers correct		1		1		
		(ii)	Killer shrimp cannot live in water with a salt content of >2.5%			1	1		
		(iii)	<ul style="list-style-type: none"> • Clothing/boots/shoes/wellingtons/waders/trousers/ wetsuits/ diving equipment • Fishing tackle/rods/reels • Dumping of ships water ballast • Wildlife qualified – aquatic birds/ducks/gulls/ predators Ignore whether candidate is referring to killer shrimp eggs or adults		1		1		
		(iv)	$\frac{55.1}{35} = 1.6 \text{ (years)}$ 1.6 = Award 2 marks (correct answer, to 1 dp) If 2 marks are not awarded, award 1 mark for correct method with the use of correct data $1.574/ 1.57/ 1.5 = 1 \text{ mark}$		2		2	2	
			Question 26 total	2	6	1	9	2	0

Question		Marking details	Marks Available					
			AO1	AO2	AO3	Total	Maths	Prac
(a)		They {have the same <u>genus</u> / are both <u>Apis</u> }(1) They {are closely related/ have similar genes/ are similar/ are similar species}(1)		2		2		
(b)	(ii)	5%/5.0%/4.97%/4.970%/4.9697/ 4.969696969697% = 2 marks Accept 4.9696 recurring If answer incorrect or incorrect rounding accept 82/1650 x 100 or 4.96= 1 mark		2		2	2	
(c)	(i)	Any one (x1) from <ul style="list-style-type: none"> Using pesticides causes more (winter) losses Pesticides do not reduce percentage (winter) loss Pesticides are harmful to bees 2014/2015 losses are the same/ no difference between losses in 2014 and 2015 			1	1		1
	(ii)	Any two (x1) from: <ul style="list-style-type: none"> Survey only involves {small number/ 5%} of beekeepers/ small sample size/ not enough beekeepers took part only carried out in North Wales/ does not represent other parts of the country/ only in one area Has not been reproduced by any other people 			2	2		2

Question	Marking details	Marks Available
(a)	Turtle dove + <u>greatest</u> decrease/ decreased the most/ highest decrease;	1
(b)	1040;	1
(d)	Decrease + {fewer/ less} species/ less biodiversity/ species die out/ fewer bird species;	1