

WJEC (Eduqas) Biology GCSE  
Topic 6.1 Levels of Organisation  
Within an Ecosystem  
Questions by Topic - Mark  
Scheme

1.

Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(c)	2	There is <u>less</u> light/ water/ minerals/ ions/ nutrients; Because of { <u>more/ most</u> } competition from the parent population;			Parent plant takes <b>all</b> (named resource) space

2.

Question	Marking details	Marks Available
(a)	10;	[1]
(b)	4.5; 3.2;	[2]
(c)	Any two from: Competition for/ shortage of/ less/ running out of: light; water; nutrients/ minerals; space/ room; carbon dioxide;	[2]

3.

Question	Marking details	Marks Available
3 (a)	2.5;	1
(b)	0.25;	1
(c)	Any <b>three</b> from: light/ sunlight; NOT sun water; NOT moisture/ rain nutrients/ minerals/ salts/ named mineral; NOT food/ salt space; NOT room/ area carbon dioxide/ CO <sub>2</sub> ;	3

4.	Question	Marking details	Marks Available
	(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;">             Pike 250 kg              Minnows 500 kg              Beetles 800 kg              Snails 4500 kg              Aquatic Plants 45000 kg           </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
		<b>Question 4 Total</b>	<b>[6]</b>

5.

Question		Marking details	Marks Available
5	(a)	(i) 2 17 3456 1 all correct 1 mark	1
		(ii) I <b>Four trophic levels showing the correct shape and labelled;</b> <div style="text-align: center;"> <p>oak tree 5137kg caterpillars 43kg blue tits 1.2kg sparrowhawk 0.18kg</p> </div> II All masses correct including units; (independent of shape)	1
	(b)	Food chain column correct; Trophic level column correct;	1 1
		<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>oak tree → caterpillars → blue tit → sparrowhawk</p> </div> <div style="text-align: center;"> <p>decomposers</p> </div> <div style="text-align: center;"> <p>producer → First stage consumer → Secondary/ second stage consumer → tertiary</p> </div> </div>	

6.

Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(a)	(i)	2			
		<p>1353 + 2567 + 1941 = 5186</p> <p><u>5186</u> x 100 =</p> <p>20000</p> <p>29.31 % Award 2 marks</p> <p>29.305/ 29.3/ 29.30% Award 1 mark</p> <p>Award 1 mark for incorrect answer but evidence of</p> <p><u>x</u> x 100</p> <p>20000 .</p>			
	(ii)	2			
		<p>Any 2 (x1) from:</p> <ul style="list-style-type: none"> <li>• <u>heat from respiration</u>;</li> <li>• <u>excretory waste/ excretion/ named excretory waste e.g. urine</u>;</li> <li>• <u>not all of organism digested/ eaten/ faeces/ egestion</u>;</li> </ul>			
(b)		2			
		<p>1 mark for 3 organisms in correct order;</p> <p>1 mark for correct masses of these 3 organisms with units;</p> <div style="text-align: center;"> <pre> graph TD     A[KESTREL 0.34 kg] --- B[GRASSHOPPERS 5.12 kg OR SEED-EATING BIRDS 1.08 kg OR FIELD MICE 1.05 kg]     B --- C[GRASS 350kg]             </pre> </div> <p>[1]</p>			
		6			

7.

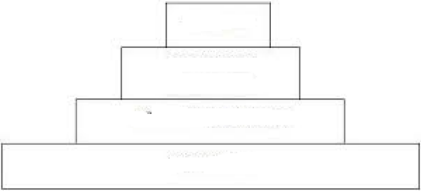
Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(b)		2			
		<div style="text-align: center;"> <pre> graph TD     A[pike (22.00kg)] --- B[perch (112.5 kg)]     B --- C[large insects (1125.00 kg)]     C --- D[small insects (12 500.00 kg)]     D --- E[algae (112 000.00 kg)]             </pre> </div> <p>Pyramid drawn with names;</p> <p>Masses correct &amp; correctly placed; kg only needed once</p>			
(c)	(i)	2			
		<p>(5.62 – 0.03 = 5.59);</p> <p>(5.59 ÷ 0.03 x 100 =) 18 633.3 (%);</p> <p>Two marks for correct answer</p> <p>Allow one mark for 5.59</p>	19 000/ 18633 for two marks		
	(ii)	1			
		<p>{bioaccumulation/ concentration/ build up} of {DDT/ insecticide} in {their tissues/ them} had reached {toxic/ lethal/ poisonous} levels;</p>			

8.

Question		Marking details	Marks available					
			AO1	AO2	AO3	Total	Maths	Prac
(a)	(i)	25 = 2 marks If incorrect award 1 mark for $100/400 \times 100$ $0.25 \times 100$		2		2	2	
	(ii)	0.180 = 3 marks $0.180180/ 0.18/ 0.1802/ 0.18018/ 0.2 = 2$ marks 0.1801= 1mark Or $400/222.000 \times 100 = 1$ mark If use biomass instead ( $100/34900 \times 100$ ) 0.287 = 2 marks $0.28653295/ 0.286533/ 0.28653/ 0.2865/0.29/0.3 = 1$ mark Or $100/34900 \times 100 = 1$ mark		3		3	3	
(b)		C(1) because there are three {levels/ stages} and {there is more plankton than mussels/ the numbers decrease as you go up/ pyramid shaped} (1) 2 <sup>nd</sup> mark linked to 1 <sup>st</sup>		1	1	2		
<b>Question total</b>			<b>0</b>	<b>6</b>	<b>1</b>	<b>7</b>	<b>5</b>	<b>0</b>

9.

Question		Marking details	Marks available					
			AO1	AO2	AO3	Total	Maths	Prac
(a)	(i)	A: producers B: {primary/ first (stage)} consumers Ignore herbivore C: {secondary/ second (stage)} consumers Ignore carnivores D: {tertiary/ third (stage)} consumers Ignore carnivores <b>All correct for 1 mark</b>		1		1		
(b)	(i)	= $0.049/ 0.05/ 0.048648/0.04865/0.0486 = 2$ marks If incorrect award 1 mark for: $0.048/ 0.04864/ 0.04$ or any other incorrect rounding or $\frac{2500}{5139000} \times 100$ (1)		2		2	2	
	(ii)	<ul style="list-style-type: none"> <li>A pyramid of numbers shows there is a small number of producers/ example e.g. only 1 oak tree (1)</li> <li>A pyramid of biomass shows there is a large mass of producers/ example e.g. the 1 oak tree may have a very large mass (1)</li> </ul> Reference to animals instead of plants negates the mark			2	2		
	(iii)	faeces/ heat/ excretory waste/ urine/ egested waste/ respiration ignore: growth/ movement/ excretion	1			1		
<b>Question total</b>			<b>1</b>	<b>3</b>	<b>2</b>	<b>6</b>	<b>2</b>	<b>0</b>

Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept
(a)	(i)	1	Sun/ solar/ sunlight; NOT light alone			
	(ii)	1	Flow of <u>energy</u> / transfer of <u>energy</u> / description of <u>energy flow</u> ;			
(b)		1	Correct shape as below – 4 layers; no labels required reject incorrect labels 			
(c)		2	{fewer/no} greenflies, so {fewer/no} ladybirds; so {{fewer/no} robins/ robins die}; OR {Pesticide/ it} builds up along food chain / bioaccumulation; So fewer robins/ robins poisoned/ robins die			
Total Mark		5				

Question		Marking details	Marks available					
			AO1	AO2	AO3	Total	Maths	Prac
(a)	(i)	sunlight / solar/ sun NOT light unqualified/ sunshine	1			1		
	(ii)	<b>Any one (x1) from</b> (lost as) heat (1) in respiration (1) waste materials / faeces/ urine (1) NOT excretion	1			1		
(b)		1 true 2 false 3 true 4 false 5 true 5 correct =3 marks 4 correct = 2 marks 3 correct = 1 mark 0/1/2 correct = 0 marks		3		3		
(c)	(i)	<del>Oak tree</del> , beetles, spiders, small birds, weasels		1		1		
	(ii)	Pyramid with 5 layers and correct shape (1) All organisms correct (1)		2		2		
<b>Question total</b>			<b>2</b>	<b>6</b>	<b>0</b>	<b>8</b>	<b>0</b>	<b>0</b>

Sub-section		Mark	Answer	Accept	Neutral answer	Do not accept												
(a)		1	Eats meat/ other animals;		insects													
(b)		3	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">factor</th> <th style="width: 30%;">Tick (✓) the three correct boxes</th> </tr> </thead> <tbody> <tr> <td>A disease harming the badgers</td> <td></td> </tr> <tr> <td>An increase in the number of foxes</td> <td>✓;</td> </tr> <tr> <td>The arrival of a new second stage consumer species</td> <td>✓;</td> </tr> <tr> <td>An increase in the number of beetles</td> <td></td> </tr> <tr> <td>A decrease in the area of woodland</td> <td>✓;</td> </tr> </tbody> </table>	factor	Tick (✓) the three correct boxes	A disease harming the badgers		An increase in the number of foxes	✓;	The arrival of a new second stage consumer species	✓;	An increase in the number of beetles		A decrease in the area of woodland	✓;			
factor	Tick (✓) the three correct boxes																	
A disease harming the badgers																		
An increase in the number of foxes	✓;																	
The arrival of a new second stage consumer species	✓;																	
An increase in the number of beetles																		
A decrease in the area of woodland	✓;																	
Total Mark		4																

13.

Sub-section	Mark	Answer	Accept	Neutral answer	Do not accept
(a)	1	herbivores;			
(b)	1	A;			
(c)	i	5 and 7;			
	ii	400;			
	iii	5(m <sup>2</sup> );	ecf (ii)		
	iv	220;			
(d)	3	<b>any three from:</b> <ul style="list-style-type: none"> <li>• <u>not enough/ competition for</u> {food/grass}/ not enough to eat;</li> <li>• disease;</li> <li>• (qualified reference to weather/climate) e.g. too hot/ too cold;</li> <li>• increase in {predators/ hunters/OWTTE};</li> <li>• <u>not enough/ competition for</u> water;</li> </ul>	drought	Ref to reproduction alone	No/ less/ lack of food  illness  Climate change
Total Mark	9				

14.

Question	Marking details	Marks available					
		AO1	AO2	AO3	Total	Maths	Prac
(a)	<p><b>Indicative content:</b></p> <ul style="list-style-type: none"> <li>• Herbivores Any two from: rabbits, mice, flies, aphids,</li> <li>• {Second stage consumers/carnivores} Any two from: birds of prey, shrews, spiders, ladybirds</li> <li>• more plants</li> <li>• {Herbivore/ flies/ aphids/ mice} increase in number</li> <li>• {carnivores/ shrews/ spiders/ ladybirds} increase in number</li> <li>• Numbers of mice could decrease</li> <li>• mice are the <u>only</u> source of food for birds of prey</li> <li>• numbers of birds of prey decrease</li> <li>• reference to competition</li> </ul> <p><b>5-6 marks</b>  <i>Herbivores and second stage consumers identified. Explanation of effect on populations if rabbits destroyed. Mice affected differently from other herbivores. 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><b>3-4 marks</b>            Reference to increased plant growth giving more food for named herbivores and hence secondary consumers (unnamed), Different status of mice not recognised</p> <p><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><b>1-2 marks</b>            Any reference to increased food for herbivores with examples. OR any relevant reference to secondary consumers with an example.</p> <p><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>	3	3		6		



15. Question			Marking details	Marks available					
				AO1	AO2	AO3	Total	Maths	Prac
15	(a)	(i)	{absorbs/ uses/ needs/ takes in} (less) light/ has leaves/ it is green/ produces sugar Reject reference to fungi		1		1		
		(ii)	reference to {sucking/ feeding/ eating} from {barley/plant/ leaves/ crops/ producer/ stem}/ get sugar from crops/ {aphids/ they} are eaten by (ladybirds which are) <u>secondary consumers</u>		1		1		
		(iii)	secondary consumers/ eat {aphids/pests/ insects/ other animals} NOT target pests	1			1		
		(iv)	pesticides {toxic to/kill} harmless organisms (1) ladybirds {target/only eat} {pests/aphids} (1)		1		1		
(b)	(i)		1.2 = 2 marks 1 mark for calculation if answer incorrect $8.0/100 \times 15$ ;		2		2	2	
		(ii)	£140.40/ 140.4 = 1 mark <b>Ecf from (i)</b> 1.2 (answer from (i)) x 117.00		1		1	1	
			<b>Question 15 Total</b>	<b>1</b>	<b>7</b>	<b>0</b>	<b>8</b>	<b>3</b>	<b>0</b>

16. Question			Marking details	Marks Available	
16	(a)		655 – 280 = 375 <u>375</u> x 100 = 655 = 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
			(ii)	Numbers of { <u>some</u> birds/named birds (Snipe/Dunlin)} dropped (without introduction of hedgehogs);	1
			(iii)	{Lack of/no/less} {predators/carnivorous mammals/carnivores}; Abundance of {food/ eggs}/large variety of food/less competition for food;	2
			<b>Question 16 Total</b>	<b>[7]</b>	

17.

Question	Marking details	Marks Available
(c)	Eats plants/vegetation; (NOT - does not eat meat/they are vegetarians) neutral – eats {grass/ vegetables/ veg}	1
(d) (i)	I {percentage/ %} <u>dark</u> sheep;	1
	II correct plotting +/- $\frac{1}{2}$ 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

18.

Question	Marking details	Marks Available
(a)	Sun/ solar; NOT light/ sunlight	1
(b)	<u>Energy</u> ;	1
(c)	(i) 20; Correct answer = 2 marks If incorrect answer allow one mark for $(500/2500) \times 100$	2
	(ii) <u>Respiration/ respiring/ respire</u> ;	1

Question 18 Total

[5]