

The Organisms in the Environment

Mark Scheme 4

Level	IGCSE(9-1)
Subject	Biology
Exam Board	Edexcel IGCSE
Module	Single Award (Paper 2B)
Topic	Ecology and the Environment
Sub-Topic	The Organisms in the Environment
Booklet	Mark Scheme 4

Time Allowed: 63 minutes

Score: /52

Percentage: /100

Grade Boundaries:

9	8	7	6	5	4	3	2	1
>90%	80%	70%	60%	50%	40%	30%	20%	10%

Question number	Answer	Notes	Marks
1 (a) (i)	<u>plastic</u> ;		1
(ii)	1. repeated / ten trays / lots of plants / several trays / eq; 2. calculates average / mean; 3. discard anomalies / check for anomalies / concordant results / eq;	Allow outliers	Max 2
(iii)	1. carbon dioxide; 2. temperature / heat; 3. water / humidity / moisture; 4. soil type / soil mass / amount of soil / minerals / ions / fertiliser / <u>soil</u> pH;	Ignore light / time / wind / oxygen 4. Ignore nutrients	Max 3

<p>(b)</p>	<p>1. light;</p> <p>2. prevents growth of other plants / less competition from other plants / fewer weeds / prevents photosynthesis of other plants;</p> <p>OR</p> <p>3. absorbs heat / warmer soil / insulates / eq;</p> <p>4. affects enzymes / affects reactions / affects respiration / affects movement of molecules;</p> <p>OR</p> <p>5. plastic prevents <u>evaporation</u>;</p> <p>6. soil retains water / more water for the plants to use;</p> <p>OR</p> <p>7. prevent pest access;</p> <p>8. less plant damage / eq;</p>	<p>Only allow maximum of two reasons and two explanations</p> <p>Ignore attracts heat</p> <p>Ignore photosynthesis</p> <p>Ignore microorganisms</p>	<p>Max 4</p>
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Question number	Answer	Notes	Marks
2(a) (i)	0.52 / 0.5 / 0.521;;	Allow one mark for correct use of 8863 as numerator (ie not if in list) Ignore 0.52135	2 1
(ii)	<u>light</u> misses plant / <u>light</u> misses chloroplast / <u>light</u> not absorbed / <u>light</u> reflected / eq;	Ignore reference to heat / energy / respiration / rays	
(b)	1. respiration; 2. not digested / cellulose / egested / faeces; 3. not eaten / eq;	Ignore growth / active transport / heat loss / movement / heat loss by consumer / excretion	2 max

Total 5 marks

Question number	Answer	Notes	Marks								
3(a)	<table border="1" data-bbox="477 384 1460 730"> <thead> <tr> <th data-bbox="477 384 629 523">area</th> <th data-bbox="629 384 1460 523">Increase in biomass in g per m² per year</th> </tr> </thead> <tbody> <tr> <td data-bbox="477 523 629 592">A</td> <td data-bbox="629 523 1460 592">125</td> </tr> <tr> <td data-bbox="477 592 629 660">B</td> <td data-bbox="629 592 1460 660">110</td> </tr> <tr> <td data-bbox="477 660 629 730">C</td> <td data-bbox="629 660 1460 730">?</td> </tr> </tbody> </table> <p data-bbox="477 799 539 834">85;;</p>	area	Increase in biomass in g per m ² per year	A	125	B	110	C	?	<p data-bbox="1491 775 1854 847">Allow one mark for 1700 in working</p>	2
area	Increase in biomass in g per m ² per year										
A	125										
B	110										
C	?										

(b)(i)	<ol style="list-style-type: none"> 1. (more) (sun)light; 2. water / rainfall; 3. photosynthesis; ONCE 4. warmer/ higher temperature; 5. enzymes; 6. (more) mineral ions / named mineral ion / eq; 7. <u>use of named</u> mineral ion; 	<p>Ignore carbon dioxide / oxygen / pollution</p> <p>Mp 6 ignore growth</p> <p>nitrate for amino acids = Mp 5 and Mp 6</p> <p>Mp 5 ignore nutrients / fertiliser</p>	4 max
(ii)	<ol style="list-style-type: none"> 1. fewer herbivores / less grazing / fewer plants eaten / fewer consumers / fewer pests / eq; 2. fewer weeds / fewer different plants / less competition from other plants; 3. less disease / less infection; 4. more nitrogen fixing / nitrifying bacteria; 	Mp 1 ignore predator	2 max
(c)	0.079 / 0.08 / 0.0791;	<p>Ignore 0.0790625</p> <p>Allow one mark for 2530 in working</p>	2

Question number	Answer	Notes	Marks
4(a)	goshawks / bird of prey / named bird of prey;		1
(b)	1. small(er) SA:VOL; 2. less heat loss / retain heat / keep warm; 3. more fat / food reserves; 4. (for) respiration / energy / insulation;	1. allow larger VOL: SA 4. must be linked to Mp3	2
(c)	1. more food / seeds / eq; 2. warmer / not cold / eq;	ignore in good condition ignore lack of predators	2
(d) (i)	(place/area/environment) where organisms/plants/animals/population/community live / eq;		1
(ii)	number / how many / all / amount OF <u>same</u> / <u>a</u> / <u>one</u> / <u>the species</u> ;	allow number of red/grey squirrels ignore number of squirrels ignore number of species	1
(e)	5.3(03)%;;	one mark for 2 640 000 in working	2
(f)	1. better competitors / outcompete / eq; 2. more resistant to disease; 3. better camouflage / description of camouflage / eq; 4. fewer predators / not eaten by goshawks / eq; 5. fecundity / reproduce more / eq;		2

(g)	<ol style="list-style-type: none"> 1. study area with red AND study area with grey squirrels; 2. count / record / compare number of woodland birds; 3. same area / type / sample of woodland / eq; 4. eference to time; 5. idea of repeating; 	<ol style="list-style-type: none"> 2. monitor = 0 allow count / record with any method 	3
(h)	<ol style="list-style-type: none"> 1. trap / shoot / poison / kill / hunt grey squirrels / eq; 2. (captive) breeding of red squirrels / cloning / zoos / selective breeding; 3. provide more food / pine cones / seeds; 4. set up nature reserves / fencing / move to place with no grey squirrels / eq; 5. biological control / shoot goshawk; 6. vaccination / antibiotic; 	<ol style="list-style-type: none"> 4. eg restrict human access 	2

(Total for Question = 16 marks)

Question number	Answer	Marks
5 (a) (i)	20 / twenty;	1
(ii)	54 / 54.0; 10 + inside;	2
(b) (i)	<u>in</u> or <u>out</u> (of the box) / indoors or outdoors; time;	Max 1
(ii)	temperature;	1
(iii)	fair test / (increased) validity; ignore accurate / reliable (valid) comparison / eq; no other factor affected results / other factor/example affects results / only independent variable affected results / eq;	Max 2
(c)	leave thermometer in water; stir water; digital / electronic thermometer; measure to smaller temperature interval; reference to parallax / eq; measuring cylinder / eq; stopwatch / eq;	1

(d)	heat loss / cooling / eq; maintain body temperature / temperature constant / keep warm; energy used / less energy for growth / more food / eq; respiration; (more) movement;	Max 3
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Total 11 Marks