

Food Chain and Pyramids of Biomass MS

QUESTION 1

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	triangular pyramid with 3 layers layers appropriately labelled: bean / plant aphid, ladybird	may be as blocks or as triangle ignore food chains and arrows labelled in food chain order must not contradict correct pyramid allow correctly labelled inverted pyramid for 2 marks	1 1
a)ii)	any two from: (for aphid / ladybird) not all digested / faeces loss in urine loss of CO ₂ not all eaten	ignore energy ignore loss of CO ₂ from bean plant if none of first 3 points given then allow waste (materials) / excretion for 1 mark	2
Total marks			4

QUESTION 2

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	1800(g)		1
a)ii)	triangular pyramid with four layers correctly labelled in order of food chain	accept ecf from (a)(i) allow inverted pyramid	1 1
b)	any two from: <ul style="list-style-type: none"> • (lost as) crab faeces / not all digested • (lost as) crab urine / urea • loss of carbon dioxide by crab • not all the limpet is eaten eg don't eat the shell • not all limpets are eaten (by crabs) 	allow waste / excretion for one mark if neither faeces nor urine are given accept (lost via) respiration allow not enough crabs to eat all the limpets / the limpet population ignore energy losses, such as movement	2
Total marks			5

QUESTION 3

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	sun	ignore light apply list principle	1
a)ii)	photosynthesis	apply list principle allow approximate spelling do not accept phototropism	1
b)i)	chemical		1
b)ii)	carbon dioxide		1
b)iii)	carbohydrates		1
c)	As carbon dioxide from the caterpillar As faeces (droppings) from the blue-tit	if more than 2 boxes ticked deduct one mark for each additional incorrect box	1 1
Total marks			7

QUESTION 4

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	0.6 or 6×10^{-1}	for correct answer if no / incorrect answer $2.4 \times 10^4 \times 100$ 4×10^6 or 0.006 or 6×10^{-3} gains 1 mark	2
a)ii)	any two from: reflected not absorbed or misses chloroplasts / chlorophyll wrong wavelength photosynthesis inefficient allow some lost through respiration / as heat (from respiration)	ignore some of light is green allow transmitted or passes through leaves allow hits other plant parts accept other limiting factors / named	2
b)	energy lost via faeces / not digested / waste / excreted (of insect-eating birds) energy loss via respiration / movement / muscle contraction / heat (by insect-eating bird) some of (insect eating) bird not eaten but all / most / more of insect is eaten	accept examples of muscle contraction do not accept energy used for respiration	1 1 1
Total marks			7

QUESTION 5

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)		if more than one box is ticked award no mark	1
b)	<p>increasing / higher light / temperature</p> <p>more / increased photosynthesis</p>	<p>ignore references to months other than February – April</p> <p>do not accept mineral /ions increase</p> <p>for both marks there must be a reference to 'more' at least once (e.g. 'more light for photosynthesis' gains 2 marks)</p> <p>allow 1 mark for reference to light and photosynthesis without an idea of 'more'</p>	<p>1</p> <p>1</p>
c)	<p>increase due to increase in plant plankton / food</p> <p>decrease due to fall in plant plankton / food or decrease as eaten by (basking) sharks</p>		<p>1</p> <p>1</p>
d)	<p>fall due to use / intake by plant (plankton)</p> <p>increase due to decay / decomposition /breakdown</p> <p>of dead (plant / animal) plankton</p>	<p>ignore ref to no change section of graph</p> <p>for fall allow March / April</p> <p>ignore May / February</p> <p>for increase allow any month in range August to November</p> <p>ignore December</p> <p>allow of dead organisms / waste</p>	<p>1</p> <p>1</p> <p>1</p>
Total marks			8

QUESTION 6

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)i)	pyramid of three layers of diminishing size three labels in food chain order	either way up award 2 marks only if the pyramid is correctly labelled accept trees / birch accept (peppered) moth(s) / larvae	1 1
a)ii)	some material is lost in waste from the birds peppered moth larvae do not eat all the leaves from the trees		1 1
Total marks			4

QUESTION 7

QUESTION	ANSWER	EXTRA INFORMATION	MARKS
a)	3-layered triangular pyramid (pyramid) labelled in food chain order	as blocks or layered triangle, ignore (small) gaps between layers all three labels are required for 2 marks the pyramid must be fully correct]	1 1
b)i)	C		1
b)ii)	shortest or fewest stages / transfers / (trophic) levels less losses in waste / faeces / urine / CO ₂ / excretion less loss in respiration / heat / movement	allow only if (b)(i) is C or blank allow smaller amount uneaten allow less lost keeping warm do not allow energy for respiration do not allow respiration makes energy allow less loss (of biomass / energy) or less transfer (of biomass / energy) to surroundings if neither 2nd nor 3rd point given, for 1 mark	1 1 1
Total marks			6