

	Answers	Marks	Guidance for Examiners																														
1 (a)	<table border="1"> <thead> <tr> <th>group of vertebrates</th> <th>scaly skin</th> <th>external ear (pinna)</th> <th>feathers</th> <th>glands</th> </tr> </thead> <tbody> <tr> <td>birds</td> <td>✓</td> <td>x</td> <td>✓</td> <td>x</td> </tr> <tr> <td>bony fish</td> <td>✓</td> <td>x</td> <td>x</td> <td>x ;</td> </tr> <tr> <td>amphibians</td> <td>x</td> <td>x</td> <td>x</td> <td>x ;</td> </tr> <tr> <td>reptiles</td> <td>✓</td> <td>x</td> <td>x</td> <td>x ;</td> </tr> <tr> <td>mammals</td> <td>x</td> <td>✓</td> <td>x</td> <td>✓ ;</td> </tr> </tbody> </table>	group of vertebrates	scaly skin	external ear (pinna)	feathers	glands	birds	✓	x	✓	x	bony fish	✓	x	x	x ;	amphibians	x	x	x	x ;	reptiles	✓	x	x	x ;	mammals	x	✓	x	✓ ;	[4]	
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(b)	<ul style="list-style-type: none"> • either fruit is soft or seeds, are hard / thick / have a hard / thick / protective covering or testa ; • no enzymes to digest, testa / seed coat / seed ; 	[2]	I refs to teeth																														

Question	answers	Mark	Additional Guidance
2 (d)	<p>1 <u>eutrophication</u> ;</p> <p>2 growth of algae / algal bloom / weed growth ;</p> <p>3 reduces light reaching other plants ;</p> <p>4 algae / plants, die ;</p> <p>5 bacteria, decompose / feed on, dead plants ; A dead animals / 'eat'</p> <p>6 <u>aerobic</u> respiration ; A aerobic bacteria</p> <p>7 (bacteria cause) oxygen (concentration in water) to decrease ;</p> <p>8 (so) fish / invertebrates / animals, suffocate / die / migrate ;</p> <p>9 AVP ; e.g. any further detail or consequence of any of the above marking points, e.g. reduces biodiversity / destroys food chains</p>	[max 4]	<p>e.g. from lack of light / no resourc</p> <p>A decomposers / fungi / microorganisms for bacteria</p> <p>R decrease in oxygen if linked to less photosynthesis</p> <p>R change in pH / toxins as cause of death</p> <p>must be linked to shortage of oxygen (however caused)</p>
[Total: 15]			

Question		Answers	Marks	Additional Guidance
3	(a)	group of organisms / individuals, of same species ; can interbreed ; live in same area / habitat (at same time) ;	max 2	R 'people'
	(b)	<ol style="list-style-type: none"> 1 numbers of brown plant hoppers remain low, up to 40 days / day 40 ; 2 low numbers when spraying occurs (days 15 to 38) ; 3 rapid increase when spraying stopped / AW ; 4 then, crash / decrease ; 5 any population figure with unit ; e.g. to maximum of over 1000 per m² 	max 3	<i>ignore</i> ref. to resistance
	(c)	pesticide absorbed by the plants ; transported through the plant in the phloem ; ingested / AW, by insect when it, eats / sucks ; toxic / poisonous, to insect ;	max 2	A 'eats the plant'
	(d)	<ol style="list-style-type: none"> 1 no population explosion / AW ; 2 effective at reducing the numbers / AW ; 3 ref. to comparative figures from the graph ; 4 no pollution / damage to environment ; 5 no killing of harmless species ; 6 no concentration of pesticide in food chain ; 7 no pesticide left in foods / no harm to humans from the spray ; 8 no development of resistance to pesticide ; 9 less cost / economic benefits ; 10 AVP ; e.g. accept part of natural food chain 	max 3	

Question		Answers	Marks	Additional Guidance
3	(e)	1 decreased rainfall ; 2 flooding ; 3 erosion / loss of (top)soil ; 4 desertification ; 5 silting of rivers ; 6 loss of (plant) nutrients / soil fertility ; 7 disruption to food chain ; 8 loss of habitat ; 9 extinction / loss of biodiversity ; 10 effect on carbon dioxide in the atmosphere ; 11 justification for effect ; A unproductive forest / productive crop 12 AVP ;	max 4	A species become, rare / endangered A increase or decrease if justified e.g. leading to global warming
			[Total : 14]	

Question		Answers	Marks	Additional Guidance
4	(a)	amylase ; prote(in)ase ; lipase ;	[3]	R carbohydrase R trypsin / pepsin / peptidase R 'protase', A 'proteas'
	(b)	<ol style="list-style-type: none"> 1 prevents spread of (named) disease / AW ora ; 2 avoids pollution / removes harmful substances ; 3 makes, water / sewage / effluent, safe / AW ; 4 avoids smells ; 5 recycling of water ; 6 AVP ; e.g. ref. to eutrophication 	[max 1]	<p>A removes harmful microbes / bacteria R 'germs' A examples</p> <p>no need to specify for whom or what it is safe, but R 'safer' unqualified, treat 'marine organisms' as 'aquatic'</p>
	(c)	<ol style="list-style-type: none"> 1 mixes microorganisms with sewage ; 2 good contact between microorganisms and solids ; 3 more collisions ; 4 (aerobic) respiration ; R if anaerobic respiration 5 microorganisms produce carbon dioxide ; 6 gain / release / transfer, energy ; 7 (for) growth ; 8 (for) reproduction ; 9 to make enzymes ; A ref. to digestion 	[max 4]	A microbes / bacteria
	(d)	to start the breakdown of the sewage quickly ; continuous process ; do not have to, breed / buy, the microorganisms ; <i>idea of</i> without waiting for the lag phase ;	[max 3]	<p>A 'the right organisms to digest the sewage'</p> <p>A ref. to cost / less wastage of microbes A keeps the population of microbes constant <i>idea</i> R 'to save time' unqualified R 'to use over and over again'</p>
	(e)	destroys / kills, bacteria / microorganisms ; prevents spread of, disease / pathogens ; makes water suitable for drinking ;	[max 2]	R disinfection R 'removes bacteria'
			[Total: 13]	