

1 (a)	<p>MP1 reduction of (wild) habitat / change the ecosystem ; MP2 area too small to support many organisms ; MP3 populations, are too small / isolated, to survive / breed; MP4 disruption to food chain / food web ; MP5 flooding ; MP6 erosion ; MP7 leaching of minerals ;</p>	[max 3]
(b)	<p>MP1 more energy available ; MP2 energy loss, within / between, <u>trophic levels</u> ; MP3 energy lost in animal's, metabolism / respiration / movement / excretion ; MP4 little energy for animal growth ; MP5 (about) 90% loss / (only) 10% passed on to humans ;</p>	[max 3]
(c)	<p>MP1 burning trees gives off carbon dioxide ; MP2 less photosynthesis ; MP3 so less carbon dioxide, absorbed ; MP4 less oxygen produced ; MP5 cows give off, methane ; MP6 methane, greenhouse gas ; MP7 traps heat in the atmosphere ; MP8 less transpiration ; MP9 reduced rainfall ;</p>	[max 3]
(d)	<p>soils, are thin / have little humus content ; no / less, recycling organic material ; competition for minerals from crop ; constant cultivation, removes / overuses, minerals ; plant pest population increases ;</p>	[max 2]
(e)	<p>less, forest cleared ; less energy used ; less water used in paper production from recycled paper ; less waste to, landfill ; less rubbish burnt, so less carbon dioxide given off ;</p>	[max 2]
		[Total: 13]

Question	Answers	Marks	Additional Guidance
2 (a)	community and the environment / abiotic factors ; interacting / interdependent / in a given area ;	[2]	
(b)	<i>mammals have</i> 1 fur ; 2 sweat glands ; 3 pinnae / external ears ; 4 three middle ear bones ; 5 mammary glands / secrete milk ; 6 different types of teeth ;	[max 3]	
(c)	any two suitable suggestions e.g. good sense of hearing / smell / touch refuge / hide during day correct ref. to rods / cones ;;	[max 2]	
(d)	1 give some protection for endangered species / prevent extinction ; 2 encourages biodiversity ; 3 maintains (natural) habitats ; 4 encourages genetic diversity ; 5 maintain food, webs / chains ; 6 services that wild places provide ; 7 increasing awareness / education / research ;	[max 4]	
(e)	<i>ideas of the following required</i> breed and have fertile offspring ; examine DNA to show that they are similar / have similar genes ;	[max 1]	
		[Total: 12]	

3 (a)	decrease number of trees used / less deforestation ; any consequence for biodiversity ; less carbon dioxide produced (by burning) ; A ora ref to greenhouse gas / global warming ; less energy needed to recycle compared to making paper from trees ;	[max 3]	
(b)	bacteria continue to, secrete / release / produce, enzymes / lipase ; (therefore) maintain / increase, concentration of lipase ; (over time) lipase may become, inactive / 'used up' / denatured ; bacteria reproduce ;	[max 3]	
(c)	<ol style="list-style-type: none"> 1 no enzyme activity ; 2 bacteria (killed so) do not produce any enzymes ; 3 enzymes are denatured ; 4 destruction of, active site / shape of enzymes ; 	[max 2]	
[Total: 8]			

Question	E	Answers	Marks	Additional Guidance
4	(a)	carbon dioxide CO ₂ ; rice fields / cattle / land fill / rotting rubbish / oil extraction / coal mines / gas fracking sites / AW ;	2	
	(b)	(named) greenhouse gases ; trap / absorb, heat / (infra red / IR) radiation ; radiated back towards the Earth's surface / heat kept near surface / prevents heat escaping (to space) / AW ; ref to long wavelength cannot 'escape' Earth's atmosphere / AW ;	max 3	R UV radiation
	(c)	(i)		
		1 increases until 1975 ; 2 decreases from 1980 ; 3 to levels in 1930s / less than 1940; 4 <i>idea that</i> slow rate of increase to 1940 ; 5 faster rate of increase from 1945 ; 6 decrease between 1940–1945 ; 7 comparative data quotes ;	max 4	Accept reaches a peak in 1975-1980 year and emission must be given for each point, units mentioned once
		(ii)		
		1 lowers pH of, soil / water; 2 kills / damages, leaves / plants / trees ; 3 salts / minerals / ions, lost from soils ; 4 toxic to / kills, fish / animals in waters / lakes / rivers ; 5 damages, limestone buildings / bronze statues ;	max 3	A acidifies lakes A marble, gravestones, etc.

		<p>(iii) use, alternative / renewable / green / AW , sources of energy ; A example(s)</p> <p>use low sulfur fuels / ORA;</p> <p>reduce use of coal ;</p> <p>flue gas desulfurisation / 'use scrubbers' / chimney electrostatic precipitators / neutralise waste gases with lime ;</p> <p>catalytic converters ;</p> <p>(named) international treaty for reducing emissions ;</p> <p>AVP ; e.g. any method to reduce demand for energy</p>		
			max 3	car sharing / more public transport / cycle paths / AW
			[Total: 15]	