

1 (a) (i)	vertical axis – numbers/population ; horizontal axis – time/years ; curve showing exponential increase/log phase ;	[3]	I lag phase/curve starting at origin
	(ii) <i>idea that</i> 'birth' /reproduction/ breeding, rate is greater than death rate ; no limiting factors ; no/little, competition ; plenty, of food / nutrients/ space/ mates/ oxygen/ resources ; no/ few, predators ; no/ few, parasites/ pathogens/ disease ; AVP ; e.g. no/little, pollution/ waste products/ toxins	[max 4]	I definitions of exponential growth
(b)	<i>between 1950 and 2012</i> mass of fish caught increased and levels off ; 17 to 90 million tonnes/increase = 73 million tonnes ;  fluctuations/ increases and decreases/ described ; e.g. around 1970/ any time after 1990 ;  maximum catch, 94 million tonnes/ in 1996 ; steep increase between, 1950–1970/ 1973–1989 ;	[max 3]	<i>units must be used at least once</i>  <b>A</b> 16 to 18/ increase of 72 to 74  mp4 cannot be awarded without mp3

Question		Mark	Guidance
1 (c)	<p><i>answers can refer to seas, lakes and/or rivers</i></p> <p>international, agreements/treaties ;</p> <p>quotas/permits/licenses ;</p> <p>fines/sanctions, for, overfishing/illegal/unauthorised, fishing ; fishery protection vessels/wardens/patrols/AW ;</p> <p>restrictions on times when fishing can occur ;</p> <p>exclusion zones/nursery zones/‘no take’ zones/reserves ;</p> <p>total ban for some species ;</p> <p>regulations on method of fishing ; e.g. mesh size of nets/ban nets/use of lines instead/size of fishing vessel/‘fishing effort’</p> <p>education/raise awareness/any example ;</p> <p>monitoring fish stocks ;</p> <p>captive breeding (of wild fish) ; re-stocking (of wild stocks) ;</p> <p>encourage farmed fish ; e.g. provide subsidies</p> <p>AVP ; e.g. tax on wild fish/increase the cost of wild fish</p>	[max 6]	<p><b>A</b> set maximum mass/number/amount/ quantity</p> <p><b>A</b> ‘ban unauthorised fishing’</p> <p><b>A</b> consequences other than fines</p> <p><b>A</b> not in breeding season</p> <p><b>A</b> descriptions or examples</p> <p><b>A</b> named examples</p> <p><b>I</b> ban on all wild fish</p>

Question		Mark	Guidance
1 (d)	<i>definition of sustainable resource</i> renewable / self-renewing / regenerates / described ; e.g. produced as rapidly as it is removed resource, does not / will not, run out / become exhausted ; replanting / reseeded / regrowing ; AVP ; e.g. pollarding / coppicing / leaving mature trees	[max 3]	I reused / recycled
		<b>[Total: 19]</b>	

Question		Mark	Guidance
2 (a)	timber / paper, manufacture / AW ; firewood ;  <i>clearance for</i> agriculture ; urbanisation / roads / housing / factories / industry / leisure developments ; extraction of minerals / for other natural resources ;	[max 3]	<b>A</b> wood unqualified <b>A</b> fuel
(b) (i)	$118\,545 - 90\,883 = 27\,662$ $\frac{27\,662}{118\,545} \times 100$ ;  23.3(3459) ; 23 (%) ;	[3]	
(ii)	Indonesia has lost the most forest <b>ora</b> ; 9% (8.7%) compared with 23% in Indonesia ;  Indonesian forest has continued to be lost, whereas loss in Malaysia has slowed between 2005 and 2010 ; comparative use of figures with units ;	[max 3]	<b>A</b> 14% more in Indonesia ecf from <b>(b)(i)</b>
(iii)	planted forest, has one (dominant) species / is a monoculture ; loss of <u>biodiversity</u> ; qualification of biodiversity loss ;  (plantation) susceptible to pest / disease ; nutrients removed / soils become infertile ; <i>ref to alien / foreign / invasive / non-indigenous species ;</i> AVP ; e.g. vegetation is removed / lower canopy / all immature	[max 3]	e.g. habitats / example / extinction of a species <b>I</b> homes / organisms die  <b>A</b> use of chemicals

Question		Mark	Guidance
2 (c)	<p><u>roots</u> die so do not bind the soil ;  loss of soil / soil erosion ;  silting of rivers ;  reduced (soil) fertility ;  no trees to absorb the water ;  increased risk of flooding ;  increased rate of evaporation / land is exposed to drying ;  desertification / decreased soil water ;  loss of, habitat / places where organisms live / described ;  disruption to food chain / described ;  endangered / extinction, of species or loss of biodiversity ;  AVP ; named example of affected 'land' organism in context / removed trees cause nutrient cycling disruption / lack of decomposition</p>	[max 6]	<p><b>A</b> landslides  <b>A</b> loss of, minerals / ions / nutrients  <b>A</b> mudslides  <b>A</b> drought / decreased rainfall  <b>I</b> home  <b>I</b> organisms die</p>
		<b>[Total: 18]</b>	

Question	Expected Answers		Marks	Additional Guidance														
3 (a)	<table border="1"> <tr> <td data-bbox="403 232 779 284"><i>Triticum aestivum</i></td> <td data-bbox="779 232 1005 284"><b>D</b></td> </tr> <tr> <td data-bbox="403 284 779 335"><i>Solanum tuberosum</i></td> <td data-bbox="779 284 1005 335"><b>G</b></td> </tr> <tr> <td data-bbox="403 335 779 387"><i>Glycine max</i></td> <td data-bbox="779 335 1005 387"><b>C</b></td> </tr> <tr> <td data-bbox="403 387 779 438"><i>Manihot esculenta</i></td> <td data-bbox="779 387 1005 438"><b>F</b></td> </tr> <tr> <td data-bbox="403 438 779 489"><i>Ipomoea batatas</i></td> <td data-bbox="779 438 1005 489"><b>B</b></td> </tr> <tr> <td data-bbox="403 489 779 541"><i>Zea mays</i></td> <td data-bbox="779 489 1005 541"><b>A</b></td> </tr> <tr> <td data-bbox="403 541 779 592"><i>Oryza sativa</i></td> <td data-bbox="779 541 1005 592"><b>E</b></td> </tr> </table>		<i>Triticum aestivum</i>	<b>D</b>	<i>Solanum tuberosum</i>	<b>G</b>	<i>Glycine max</i>	<b>C</b>	<i>Manihot esculenta</i>	<b>F</b>	<i>Ipomoea batatas</i>	<b>B</b>	<i>Zea mays</i>	<b>A</b>	<i>Oryza sativa</i>	<b>E</b>	max [3]	5/6 right = 3 3/4 right = 2 1/2 right = 1 0 right = 0
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(b)	<p><i>general features:</i></p> <p><b>1</b> leaf, width/shape ;  <b>2</b> leaf connection to stem / AW ;  <b>3</b> number of (named) flower parts ;  <b>4</b> number of, cotyledons / seed  <b>5</b> leaves ;  <b>6</b> type of root ;  <b>7</b> pattern of vascular bundles ;  <b>8</b> presence/absence of cambium / AW ;</p>	<p><i>monocotyledon features:</i></p> <p>narrow leaves ;  sheath / no petiole ;  flower parts in multiples of 3 ;  one cotyledon / seed leaf ;  fibrous roots ;  scattered vascular bundles ;  no, cambium / woody tissue ;</p>	max [1]	<p><i>Mark answers in context of either general features (first column) or referring to monocotyledonous plants (second column)</i></p>														

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(c) (i)	<b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b> <b>6</b> <b>7</b>	increase in (soil) water / flooding / waterlogging ; decrease in (soil) water / desertification ; soil erosion ; loss of, habitat / places where organisms live ; disruption to food chain ; endangered / extinction, of species or loss of biodiversity ; AVP ; e.g. example of named soil organism in context of a function of a soil ecosystem	max [4]	<b>A</b> landslides / reduced soil volume loss of nutrients / reduced nutrient cycling
(ii)	<b>1</b> <b>2</b> <b>3</b> <b>4</b> <b>5</b> <b>6</b> <b>7</b> <b>8</b>	collecting / sorting (of paper) ; shredding / AW ; adding water to make, pulp / paste ; cleaned / de-inked / AW ; bleached ; rinsed ; pressed / rolled / flattened / dried, into sheets ; any named product made from recycled paper ; e.g. low quality paper / toilet paper / newspaper	max [3]	
			<b>[Total:11]</b>	