2009 Managing Environmental Resources

Higher

Finalised Marking Instructions

Managing Environmental Resources
Higher

Section A

Question 1

(a)	(i)	Slate/stone/sand/limestone/salt/wood/water (any two)	1
	(ii)	Slate is non-renewable/eco friendly and there would be less impact using recycled slate as in the ecohouse	1
	(iii)	Thicker insulation in loft, triple glazing, recycled paper in the wall cavity/solar panels/cavity insulation (three)	1
	(iv)	Sun light not always available/not always sunny	1
	(v)	It is a renewable resource so saves on fossil fuel use/tops up energy/ saves on energy bills/less pollution so less damage to the environment as sunlight is free	1
(b)	(i)	Plenty of rain available throughout year and can be stored	1
	(ii)	71.4	1
	(iii)	Use showers instead of baths/turn off taps when cleaning teeth/brick in toilet cistern/any other acceptable answer	1
(c)	SEPA		1

Question 2

(a)	(i)	Non-renewable – extracted from the earth – a finite resource	1
	(ii)	Vegetation cleared destroying habitats/ecosystem/food sources/ causing erosion/releases pollutants/contaminants/pollution from vehicles	1
	(iii)	Stage B where ore is refined at high temperatures to produce alumina Stage C processing of alumina by electrolysis Stage G waste aluminium melted at high temperatures (any two)	1
	(iv)	Treatment of aluminium involves production of pollutants which requires the company/the processors to take measures to deal with these	2
(b)	700		1
(c)	Transport/energy/materials/disposal of waste (any two)		1
(d)	Named source – Fossil fuel/named fossil fuel/nuclear (not renewables) Advantage – high energy output compared to renewables Disadvantage – non renewable resource being used up/production of pollution		2
(e)	Graph – add scale and label – add data – complete key		3
(f)	(i)	20.5	1
	(ii)	Indicates more is being recycled/less waste to landfill	1
	(iii)	Could be composted/better facilities for recycling/waste incineration available/more recycling	1
	(iv)	Netherlands – waste treatment Germany – use of recycling bins/CHP incinerators	1

Question 3

(a)	(i)	Using the forest for the purposes required without compromising the needs of future generations	1
	(ii)	Grew quickly and readily harvested for good profit/more for the future	1
	(iii)	Biodiversity increases - Native woodland provides greater range of habitat/food resources - Exposing streams to greater light improves habitat and variety of species able to survive there (both)	1
(b)	(i)	33,700	1
	(ii)	Grant schemes provide additional income/more costly to restore/ quicker to replant/practical difficulties with restoration	1
(c)	(i)	Sulphur dioxide/other gases from industries/power stations/transport dissolve in rain water	1
	(ii)	Less car use/use alternative means of transport	1

Question 4

(a)	(i)	Tullgren funnel	1
	(ii)	Mass of soil sample/wattage of bulb/light intensity and time left in equipment (any two)	1
(b)	(i)	More of each species found in woodland soil and mites in greatest numbers compared to earthworms and springtails Reason – more organic matter/food source/less disturbance/more moisture in woodland soil	2
	(ii)	Take more soil samples and analyse/increase sample size/repeat and average	1
	(iii)	Soil moisture and organic matter	1
	(iv)	Breakdown of dead or decaying material in the soil/in an ecosystem	1
	(v)	Pitfall trap described	1
(c)	(i)	Type of rock eg limestone/granite can give rise to a different soil profile as it weathers/effect on permeability/pH/colour/grain size	1
	(ii)	O and A where there are most roots/vegetation/humus on which soil organisms can feed	1
	(iii)	Frost/wind can break up the soil/rock particles rain/snow can cause erosion or landslip/rain can leach minerals over a period of time	1

Question 5

(a)	(i)	Red Grouse and Black Grouse	1
	(ii)	1. Heather/grass 2. Twite	1
	(iii)	Seeds – insects – Twite – Merlin or Heather – Grouse/Plover – Hen Harrier	1
	(iv)	Red & Black Grouse or Merlin and Red Grouse for nesting sites/ shelter	1
	(v)	Less energy wasted in hunting/prey more easily spotted/Grouse to be found there/prey will leave area more often and be seen	1
(b)	(i)	Ecosystem kept natural/succession prevented by human intervention	1
	(ii)	Need to be aware of breeding capacity/availability/success/numbers of Grouse	1
	(iii)	Succession would occur/biodiversity altered/tree growth/result in change in vegetation/habitats	1
(c)		Named ecosystem + beneficial practice – maintaining/planting hedgerows, tree planting, organic methods Negative impact eg overgrazing, drainage, overuse of slurry/overuse of pesticides/fertilisers	2

Question 6

(a)	(i)	Social – people stay in area, local amenities improve, educational value Economic – more money from tourism for local businesses	1
	(ii)	Bird watchers and walkers – hides located away from main footpaths, careful use of signposts Trail bikers and walkers – specialist trails	2
	(iii)	Horse riding/bird watching/walking (any two)	1
	(iv)	Tree cutting/tree planting/moving timber/health and safety (deer culling) pest control/soil erosion	1
	(v)	Forestry Commission	1
(b)	(i)	Wildlife and Countryside Act 1981	1
	(ii)	Town and Country Planning Act 1990	1
	(iii)	SSSI – Site of Special Scientific Interest NNR – National Nature Reserve	1
	(iv)	Advantage – able to wander/explore any area for pleasure/interest Disadvantage – may result in damage to property/crops/animals	2
(c)		Cairngorms or Loch Lomond & Trossachs NP Local control over development of area/protection of natural heritage/ wildlife of the area/constrains visual pollution/stricter building controls	2
(d)	(i)	Pollution problems from dumping at sea/overfishing issues/impact of global warming on sea temperatures/increase in recreational pursuits/ impacts of the oil industry	1
	(ii)	International initiatives/more patrols/better education on environmental issues	1

Question 7

(a)	(i)	Heavy rain would run off and be channelled onto flood plain where Inverness is located when it could no longer be absorbed by land due to tarmac and hard landscaping/small flood plain	2
	(ii)	More CO2, increasing global temperature/global warming resulting in disturbance of normal weather patterns	1
(b)	(i)	Use park and ride/use bus link service/use bypass (any two)	1
	(ii)	Congestion charges/increase in car parking charges/restrictions on access/creation of pedestrian precinct/ferry/new bridge (any two)	1
(c)		Social pressure – health concerns/safety concerns/car parking conflict/pleasant environment Moral pressure – need for people to be more sustainable in use of resources/ less pollution	2
(d)	(i)	Land use change – Greenfield site to housing/business, conservation site to golf development, diversification in farming or specific example	1
	(ii)	Advantage and disadvantage of land use dependent on above choice but must be to the environment	2
(e)		EIA – must consider all of the implications of the land use change on the environment and landowners/users + example eg cutting down woodland to build housing	2
		End of Section A **Total**	**80**

Section B

Essays

Question 8A

Discuss feeding relationships under the following headings:

(a) food pyramids; 5
(b) symbiotic associations; 5
(c) the impact of human activities. 5
(15)

(a)
- example of a food chain
- pyramid showing relationship between organisms at each level
- examples of different types of pyramid – numbers, biomass
- pyramid shape indicates energy loss at each level
- energy loss through heat, movement, undigested waste
- unusual pyramids of number using as example 5

(b)
- symbiosis indicates a special feeding relationship between organisms
- benefit to be gained through this association for one or both partners
- types of symbiosis each with an example

  – mutualism + example
  – parasitism + example
  – commensalism + example 5

(c) Effect of any of the following human activities on food chains/webs/feeding relationships:

- pesticides
- fertilisers
- destruction of hedgerows/deforestation
- drainage of wetland
- specific pollutant
- overfishing 5

Question 8B

Discuss population dynamics under the following headings:

(a)	predator/prey relationships;	5
(b)	density dependent factors;	5
(c)	the impact of human activities.	5
		(15)

(a)
- explanation of the terms predator/prey + example
- description/diagrammatic representation of typical interaction in terms of fluctuating numbers
- explanation of the fluctuations eg provides regulation/check on numbers
- definition of terms applied
  - natural environmental regulation
  - homeostasis
  - feedback control
  - carrying capacity

5

(b) Description/name of any of the following density dependant factors linked to their impact on populations:

- impacts on rising populations
- food availability/level of predation/territory/availability of mates
- competition for nest site/burrows/shelter
- disease
- abiotic factors such as light/water

5

(c) Effect of any of the following human activities on populations:

- pesticides
- fertilisers
- destruction of hedgerows/deforestation
- drainage of wetland
- specific pollutant
- overfishing
- urbanisation
- overgrazing
- hunting

5

Question 9A

Describe the management of aquaculture, its conflicts and the positive and negative impacts on the environment and the local community. (15)

- Examples of farmed species – salmon, trout, shellfish
- Requirements/natural resources for aquaculture
- Description of how farming is carried out
- Management/local/national practices
- Visual impact of site
- Monitoring of population/pollution
- Impact on habitats/native species
- Artificial feeding and consequences
- Use of pesticides for disease control
- Problem of 'escapes'
- Impact on local economy
- Jobs in remote areas/diversification
- Contribution to national economy
- Local conflicts described using examples.

Question 9B

Describe power generation in Scotland, its conflicts and positive and negative impacts on the environment and the local community. (15)

Examples of types of power generation and how this is done – a minimum of three

- burning of fossil fuels
- nuclear from uranium/radioactive sources
- HEP from water storage reservoirs
- biomass from waste food
- wind harnessed by turbines on windfarms
- tidal/wave action using specially designed turbines.

Conflicts described generally or specifically as appropriate to the type of power generation – a minimum of three to include:

- conflict between group A and group B;
- A and B named reason of conflict to include views of both groups.

Positive and negative impacts **as appropriate** to the type of power generation on the environment and the local community – a minimum of three.

[END OF MARKING INSTRUCTIONS]