2013 Managing Environmental Resources

Higher

Finalised Marking Instructions

Part One: General Marking Principles for Managing Environmental Resources Higher

This information is provided to help you understand the general principles you must apply when marking candidate responses to questions in this Paper. These principles must be read in conjunction with the specific Marking Instructions for each question.

(a) Marks for each candidate response must always be assigned in line with these general marking principles and the specific Marking Instructions for the relevant question. If a specific candidate response does not seem to be covered by either the principles or detailed Marking Instructions, and you are uncertain how to assess it, you must seek guidance from your Team Leader/Principal Assessor.

(b) Marking should always be positive ie, marks should be awarded for what is correct and not deducted for errors or omissions.

GENERAL MARKING ADVICE: Managing Environmental Resources Higher

The marking schemes are written to assist in determining the "minimal acceptable answer" rather than listing every possible correct and incorrect answer. The following notes are offered to support Markers in making judgements on candidates' evidence, and apply to marking both end of unit assessments and course assessments.

Part Two: Marking Instructions for each Question

Section A

Question			Expected Answer/s	Max Mark	Additional Guidance
1	**a**	**i**	Low/less energy efficient and short/shorter lifetime/ higher power rating/energy consumption higher	**1**	Any two Not – recycled
1	**a**	**ii**	Longer response time/slow to turn on, require specialised recycling/harmful mercury content	**1**	Any two Not – lower power rating
1	**b**		Non-renewable circled – metals are a finite resource/cannot be remade within a lifetime	**1**	
1	**c**		Fluorescent 5 : 1 incandescent	**1**	
1	**d**		Resources used or raw materials used/transport/ energy/disposal	**2**	All three 2 marks One/two 1 mark Not – cost of …
1	**e**		Switch off lights/appliances/standby when not in use all three Use energy efficient appliances or example other than light bulbs Insulate walls/pipes/double glazing Only boil water as required/reduce temperature on thermostat	**1**	Any three – 1 mark Other answers may be acceptable Not – solar panels
1	**f**		Installation of renewable energy technology/EMAS	**1**	
1	**g**	**i**	More energy used for industry/transport in EMDCs than in ELDCs any two More energy used for domestic use/example in ELDCs compared to EMDCs any two	**1**	Examples from EMDC and ELDC required
1	**g**	**ii**	ELDC – Dung/wood/biomass/HEP/Solar EMDC – Wind/HEP/wave/tidal/geothermal/solar/ biomass	**1**	Example from EMDC and ELDC required Not biogas/biofuel

Question			Expected Answer/s	Max Mark	Additional Guidance
2	**a**	**i**	Role – implement environmental policies/initiatives on behalf of UK/EU/for benefit of Scotland/direct local government through legislation to protect environment or specific example LA initiative – LA 21/LBAP/kerbside collection/ bin banks/recycling centres WWF initiative – Save the Tiger/Whales/Panda etc	**2**	All three 2 marks One/two 1 mark
2	**a**	**ii**	WWF – World Wide Fund for Nature NSA – National Scenic Area/Nutrient Sensitive Area	**2**	Both
2	**b**		RSPB gives tours/lectures, provides information/ posters/leaflets/magazine/books, holds group meetings RSPB helps provide a better understanding of the biodiversity of birdlife/contribution of birds to our wildlife/protects native and endangered bird species and/or habitats	**2**	Both
2	**c**		1 – Coastal areas – reduced development projects/ housing Fishing barred in certain areas/less fishing, Biodiversity maintained/improved/less trampling/ disturbance to wildlife 2 – Populations of endangered species recover/ biodiversity maintained/increased	**2**	Both
2	**d**		Tourism where least possible damage done to the environment Viewing wildlife by tourists under controlled conditions/whilst protecting wildlife/habitats	**1**	
2	**e**	**i**	Lower emissions of methane/CO_2 Less contamination of groundwater by pollutants/ leaching reduced Less land use change/fewer habitats destroyed/ more greenfield maintained	**1**	Any two Not more recycling/ less greenhouse gases
2	**e**	**ii**	Less visual/noise pollution/vermin/reduced use of resources/more useful disposal of resources/less land used up/contaminated	**1**	Any two

Question			Expected Answer/s	Max Mark	Additional Guidance
2	**f**		Germany recycling provision/fines/reward systems Netherlands – waste treatment	**1**	
2	**g**		Meeting the needs of the present generation without compromising the needs of future generations	**1**	
3	**a**	**i**	Large arthropod/large nematode worm	**1**	
3	**a**	**ii**	Root feeding nematode worm	**1**	Not bacteria/fungi
3	**a**	**iii**	Lives in soil/eaten by large nematodes/eats bacteria	**1**	Any two
3	**a**	**iv**	Pyramid drawn with named organisms selected correctly from web	**1**	
3	**b**		Heat/movement/undigested or indigestible waste or example eg nails/fur/horn	**1**	Any two
3	**c**		Mutualism	**1**	
3	**d**		$CO^2 + H_2O$ Carbohydrate/glucose + O_2	**1**	
3	**e**		Carry out nitrogen fixation/fix nitrogen Converting nitrogen gas into nitrates	**2**	Both 2 marks
3	**f**		14.17/14.2	**1**	
3	**g**		X – brown earth – large horizon of organic debris/ humus enriched topsoil Y – Podsol – presence of iron pan/peat/leached soil	**2**	Not reference to vegetation/ plant roots

Question			Expected Answer/s	Max Mark	Additional Guidance
4	**a**	**i**	Led to overgrazing, less heather, less moorland	**1**	
4	**a**	**ii**	Bracken is a much larger plant and outcompetes heather	**1**	Must include competition
4	**a**	**iii**	Grouse population would decrease as drainage led to overgrazing/changed the habitat/changes in plant community led to fewer insects/less shelter and fewer grouse surviving	**2**	Both
4	**b**	**i**	Predator – hen harrier/fox/stoat/carrion crow Habitat – moorland/moor/heather/heather plants	**1**	Any two
4	**b**	**ii**	Red grouse shooting provides income to landowners reduced when hen harriers as claimed kill many grouse Conservationists want to protect hen harriers from illegal killing as they are a rare bird of prey	**2**	Both
4	**b**	**iii**	To give chicks the best chance of survival as vermin would eat the chicks	**1**	
4	**b**	**iv**	To check if numbers are increasing/decreasing and so take appropriate action/provide information on the species	**1**	
4	**c**		Population numbers of native plant and animal species decrease + as JK outcompetes native plants/leaves less nutrients/less shelter/less nesting sites for native animal/changes biodiversity	**1**	Both

Question			Expected Answer/s	Max Mark	Additional Guidance
5	**a**	**i**	Little overlap between distribution of blanket peat and coniferous woodland other than in south west Scotland/specific example given	**1**	
5	**a**	**ii**	11.27/11.3	**1**	
5	**b**	**i**	Statutory – agency/organisation which acts on behalf of Scottish Government/UK government to implement policies/legislation/give advice	**1**	
5	**b**	**ii**	SNH – looks after natural heritage of Scotland/ help people enjoy and value our natural heritage/ provide advice to users and stewards of the countryside	**1**	Other acceptable answers
5	**c**	**i**	Prefer open areas but still need woodland for shelter/ protection/food	**1**	
5	**c**	**ii**	Easier for machinery/transport to access the area/ more economical	**1**	Not fire breaks
5	**c**	**iii**	Value of Sitka spruce to the economy/need for fast growing species	**1**	
5	**c**	**iv**	Cycling/walking/orienteering/mountain biking/ horse riding/Go Ape	**1**	Any two

Question			Expected Answer/s	Max Mark	Additional Guidance
5	**c**	**v**	(Scottish Outdoor) Access code User – close gates/take litter away/keep dogs under control/etc Steward – maintain pathways/signposting/respect rights of public/work with other groups eg LAs on integrating activities	**2**	All three 2 marks One/two 1 mark
5	**d**		To identify any possible environmental effects a new development/change in land use may cause/ specific example	**1**	
5	**e**	**i**	Bog to forestry/agriculture/peat extraction – bog/ windfarm development	**1**	Must indicate change of use
5	**e**	**ii**	Rare ecosystem/habitat/unique flora and fauna/ important carbon sink/water storage/maintain peat supply for local communities/attracts tourists	**1**	Any two
5	**f**		Glaciation/clearances/industrialisation/urbanisation/ agricultural impacts or example/war/climate change	**1**	Any two

Question			Expected Answer/s	Max Mark	Additional Guidance
6	**a**	**i**	438	**1**	
6	**a**	**ii**	Shortest sea crossing/more scenic journey	**1**	Not cheaper
6	**a**	**iii**	More direct/for connections to other UK/European destinations/quicker/potential to return faster.	**1**	
6	**b**		Increased air pollution/more greenhouse effect/ global warming/climate change Transport adds greenhouse gases/example of gas to the atmosphere which causes increase in temperatures	**2**	Any two
6	**c**	**i**	Label & scale to x axis Scale and data for number of passengers + complete key Label, scale and data for no. of liners	**3**	Must have 2 scales Must connect points Must indicate zero on vertical axes
6	**c**	**ii**	Increases with dips in 2006, 2009, 2010	**1**	
6	**d**	**i**	To allow bigger cruise ships to dock in the harbour and avoid transfer in smaller boats/easier access for disabled/increase number of visitors	**1**	
6	**d**	**ii**	Not possible to predict + reason – too many variables price of fuel/global economy/loss of popularity/ weather/season of year	**1**	
6	**d**	**iii**	Ethical – visitor pressure on cultural or natural heritage or specific description Social – more jobs/keep people in the community/ outlet for local goods/improved amenities Economic – more money for local economy	**2**	All three 2 marks One/two 1 mark

Question			Expected Answer/s	Max Mark	Additional Guidance
7	**a**	**i**	CFP/Common Fisheries Policy	**1**	
7	**a**	**ii**	Total allowable catch	**1**	
7	**b**		Farming of alternative fish/shellfish/development of fish farms/shellfish farming or specific example/ farming salmon/set up new businesses	**1**	
7	**c**	**i**	Haddock and herring stocks both decreasing as a result of overfishing	**2**	
7	**c**	**ii**	Price increases/alternative fish used/fewer haddock available/smaller fish	**1**	
7	**d**		Conservation groups/organisations and fishermen and un-intentional catch of protected species + Resolution – modifications to fishing gear or Whale watching operators and fishermen – un-intentional catch of protected species + Resolution – no take/protected zones	**2**	

Section B

Question			Expected Answer/s	Max Mark	Additional Guidance
8	**A**	**a**	• Ecosystems named eg Sand dunes, rocky shore, freshwater to woodland, brownfield/wasteland • Primary coloniser defined with relevant example(s) for chosen ecosystem • Intermediate colonisers defined/exemplified with relevant example(s) for chosen ecosystem • Climax community defined/exemplified with relevant example(s) for chosen ecosystem • Impact of succession on the development of soil/ changes to the soil/addition of humus/modification of habitats exemplified **NB Examples must be related to the ecosystem chosen**	**5**	
8	**A**	**b**	• Impact of succession on stability of the ecosystem/ stability of populations in the ecosystem • Impact of succession on biodiversity/range and type of species of ecosystem • Impact of succession on complexity of food webs in the ecosystem • Impact of succession energy capture/input into the ecosystem • Impact of succession on development of soil/soil profile/soil properties **NB Examples should relate to ecosystem chosen**	**5**	
8	**A**	**c**	• Definition of term intra-specific with example • Definition of term inter-specific with example • Definition of competition • Two examples of resources for which organisms compete • Two additional examples of resources for which organisms compete Life of resources – space, water, food, nutrients, shelter, nest sites	**5**	
				15	

Question			Expected Answer/s	Max Mark	Additional Guidance
8	B	a	• Ecosystems named eg woodland, grassland, moorland, seashore, school grounds etc • Description of technique to measure number of species of plants in the ecosystem eg quadrat or transect • Description of technique to measure number of species of animals in the ecosystem eg pitfall traps, Longworth traps, nets • Use of keys/photoshots/books to identify species. **NB technique must be appropriate to ecosystem**	**5**	
8	B	b	• Technique for measuring three named abiotic factors described including instrument used • List of factors – temperature/pH/light intensity/ moisture level/oxygen level/water flow rate/wind speed/wind direction/area of water surface. **NB technique must be appropriate to ecosystem named**	**6**	
8	B	c	• Data collection by hand/data logger/computer • Analysis in tabulated form/graph on basis of averages • Repeat and average to improve reliability of results • Ensure sources of error are minimised by using same instrument/same investigator/controlling variables to ensure conclusions are valid. **NB must include collection of data and validity/ reliability**	**4**	
				15	

Question			Expected Answer/s	Max Mark	Additional Guidance
9	**A**		• Rural practices have changed over the years from small holdings to larger farms to farm diversification and more organic farming • Changes in farming practices have resulted from intensive farming • Impact of CAP on farming practices/introduction of Set Aside • Impact of agricultural agencies and initiatives eg RSS now SRDP • Impacts of intensive farming – larger farms/ mechanisation/destruction of habitats/reduction in wildlife/removal of hedgerows/drainage of land • Changes in farm management from one dictated by high yield/high production to one influenced by conservation and economic survival through diversification • Resurgence of crofting/increased number of crofts • Organic farming • Description/explanation of farm diversification and its benefits • Use of fertilisers in excess/in moderation/use of organic alternatives • Impacts on wildlife and biodiversity of excess fertiliser use/eutrophication explained • Impacts of the use of pesticides and bioaccumulation through food webs • Sustainable practices relevant to farming such as - Reduced use of fertilisers - Reduced use of pesticides - Organic farming methods used - Crop rotation employed - Specialisation in farm animals/exotic food sources - Waste and recycling practices - Polluter pays/SEPA checks on pollution - Soil protection measures - Acceptance of conservation schemes – SSSIs, NSAs, ESAs - Farm markets/links to local shops to reduce travel • Definition of sustainability **Must include examples of initiatives and changes – up to 8 marks** **AND** **Examples of sustainable practices – up to 7 marks**		
				15	

Question			Expected Answer/s	Max Mark	Additional Guidance
9	B		• Non-renewables resources include coal, oil, natural gas/fossil fuels and uranium/nuclear fuel **Any 3 for 2 marks** Impacts can be direct and indirect • Direct impacts on landscape/sea scape, and reduction in wildlife and biodiversity include - underground mining causing subsidence/collapse - deposition of waste from coal mining/open cast creates 'pit heaps' - visual pollution an impact of deposition - water or land pollution with toxic waste an impact - habitat and ecosystem destruction - visual deposition by energy transfer from power stations by pylons - disturbance of habitats/wildlife by laying pipelines for transfer of gas/oil - visual pollution from oil platforms - water pollution from escaping oil from pipes/container ships - fracking causing earth tremors • Indirect impacts on landscape/sea scape and reduction in wildlife and biodiversity include - release of greenhouse gases by coal/oil/ gas/fossil fuels - CO_2/NO_2/methane/CFCs are greenhouse gases – two examples minimum - enhanced greenhouse effect causing increase in world temperatures/global warming - global warming leading to climate change impacting on wildlife/biodiversity - release of SO_2/NO_2 causing acid rain which reduces wildlife/biodiversity • Impacts from nuclear fuel - as a consequence of nuclear accidents at plants/planes carrying irradiated instruments - as a consequence of dumping of radioactive waste - as a consequence of decommissioning **Any 7 described/exemplified**		

Question			Expected Answer/s	Max Mark	Additional Guidance
9	**B**		**(cont)** • Actions to reduce environmental impacts - monitoring of impacts by SEPA - through legislation to ensure good practice eg polluter pays - use of alternative/renewable energy source - modification of production processes - use of scrubbers in industrial settings where fossil fuels are burned - use of catalytic converters on transport - provide alternative modes of transport not using petrol/diesel - reduce energy demand/implement energy efficiency schemes **Up to 6 marks**		
				15	

[END OF MARKING INSTRUCTIONS]