AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

General Certificate of Education

Environmental Studies 1441

ENVS1   The Living Environment

Mark Scheme

2010 examination – January series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

Environmental Studies

January 2010   **ENVS1**

Instructions: ; = 1 mark / = alternative response A = accept R = reject

Question 1

	Answers		Mark
1	**Description**	**Letter**	
	Method of preventing urban sprawl	**C**	
	NGO involved with conservation and landscape management	**G**	
	Allocation of separate areas of a lake for activities that would conflict	**B**	
	System of grants to encourage sensitive farmland management	**D**	
	Method of quantifying environment impacts	**F**	5
Total			**5**

Question 2

		Answers	Mark
2(a)(i)		Environment Agency/Natural England/Countryside Council for Wales/Scottish Natural Heritage/Council for Nature Conservation and Countryside**;** [**A** DEFRA, English Nature]	1
2(a)(ii)		Country Park/<u>Local</u> Nature Reserve/<u>L</u>NR**;** [**A** Access Land (CRoW)]	1
2(b)(i)		All factors are ascribed monetary values/financial costs of development are compared with financial benefits**;** if <u>costs > benefits</u> the project will not be supported/go ahead**;** [**A** converse]	2
2(b)(ii)		Examples of possible impacts of the development are identified eg biological, physical, social**;** magnitude of impact estimated/reference to Leopold Matrix**;** alternatives/mitigation methods/impact reductions are proposed**;** comparison with change if development does not proceed**;**	MAX 2
2(c)		Protect/maintain/preserve/improve/ create habitats/communities/natural features**;** example of appropriate habitat relating to landscape feature eg ditch, pond, hedgerow, marshlands, islands**;** named taxon which benefits**;** named human feature eg dry stone wall, barn**;** process/management feature to increase diversity eg plagioclimax, biological corridor, burning, coppicing, pollarding, grazing**;** example of appropriate designation eg National Park, Heritage Coast, AONB, green belt**;** [**A** SSSI with named landscape feature]	MAX 4
Total			**10**

Question 3

		Answers	Mark
3(a)(i)		Detritivores**;** recycle/make nutrients available (to other organisms)**;** prey/appropriate reference to food chain**;** provide surfaces/habitats for others**;** [**A** shelter]	MAX 2
3(a)(ii)		Gribble population has increased**;** increasing O_2 concentration**;** reduction in pollutants**;** reduction in suspended solids**;** [**A** turbidity] more piers/wooden boats provide more <u>wood</u> for habitats/food**;** organisms better adapted to new conditions/new conditions within range of tolerance**;**	MAX 2

3(a)(iii)		General methods**:**
		 justified number of samples (increase reliability, avoid anomalies, allow calculation of mean/stats)**;**
		 justified location of samples (random, systematic, depth)**;**
		 timing of sample collection (related to tides, seasons, length of search, time of day)**;**
		
		 Specific methods**:**
		 sample area of timber**;**
		 count gribbles per area/gribbles per hole**;**
		 estimate total wood/timber area**;**
		 calculation of total population**;**
		
		 traps/lures/nets**;**
		 kick samples/surber sampler/disturbance sampling**;**
		 count gribbles (caught by method)**;**
		
		 Lincoln Index/mark-release-recapture**;**
		   - marking that does not affect the gribbles**;**
		   - left to mix**;**
		   - second sample caught**;**
		   - formula for population calculation**;**
			MAX 4

3(b)		Fewer sources of food**;** eg photosynthesising organisms, sessile animals, detritivores**;** fewer anchoring/growing sites/habitats for fish prey**;** prey less concentrated/harder to find**;** fewer sites of shelter from <u>predators</u>**;**	MAX 2
Total			**10**

Question 4

		Answers	Mark
4(a)(i)		Higher <u>trophic level</u>**;** energy lost as food chains lengthen**;** one carnivore needs more than one prey animal**;**	MAX 2
4(a)(ii)		Provision of <u>named abiotic</u> factors eg nest site, light levels, water**;;** provision of <u>named biotic</u> features eg food, prey animals, supplementary food, pollinators, seed dispersal agents**;;** control competitors**;** control predator species**;** provision of named habitat feature/habitat enhancement (to increase diversity) eg biological corridors, habitat area, beetle banks, planting trees/hedgerows, ponds, maintaining plagioclimax**;** control of named damaging activity eg timing of coppicing and burning, removal of trees**;**	MAX 4
4(b)(i)		Lower genetic diversity/small gene pool**;** more inbreeding**;** higher probability of genetic disorders**;** reduced mating opportunities**;** [**R** interbreeding] [**R** mutation]	MAX 2
4(b)(ii)		Lack of suitable habitat (for reintroduction)/original threat still exists**;** lack of hunting/foraging skills**;** inability to recognise predator**;** inability to recognise food**;** not accepted by wild population/inability to establish territory**;** lack of immunity to local diseases**;**	MAX 2
Total			**10**

Question 5

		Answers	Mark
5(a)(i)		Survival only within a narrow/specific range of conditions; credit suitable example eg pH/O_2 concentration, nutrient availability; justified link between size of range and ability to survive;	MAX 2
5(a)(ii)		Shortage of food/water en route; natural hazards (en route) eg storms, winds, predation; human hazards (en route) eg power lines, wind turbines, lights, named pollutant, hunting; poor condition on arrival; more than one suitable area needed; valid effect of climate change eg timing of migration;	MAX 2
5(b)		(Legal) protection of birds/eggs/nests/ban wildfowling; suitable example eg Wildlife and Countryside Act, CITES; (legal) protection/designation of habitat(s); suitable example eg Ramsar, SAC, SPAs, NNR, LNR (accept SSSI); examples of up to 2 <u>different</u> aspects of habitat management eg supplementary feeding, management of water levels, predator control;; captive breeding (and release); named example of captive bred species; publicity/education (for public awareness); pressure group/fundraising; example of suitable organisation eg RSPB, WWF, Birdlife International, Wildfowl and Wetlands Trust; qualified research eg tracking migration routes;	

Quality of Written Communication

Mark	Descriptor
2	All material is logically presented in clear, scientific English and continuous prose. Technical terminology has been used effectively and accurately throughout. At least half a page of material is presented.
1	Account is logical and generally presented in clear, scientific English. Technical terminology has been used effectively and is usually accurate. Some minor errors. At least half a page of material is presented.
0	The account is generally poorly constructed and often fails to use an appropriate scientific style to express ideas.

			Mark
			4 + 2
Total			**10**

Question 6

	Answers	**Mark**
6(a)	Conditions**;;;** Qualified reference to: visible light UV light temperature nutrient availability presence of ice turbulence salinity	MAX 3
6(b)(i)	Avoid bias**;**	1
6(b)(ii)	Get representative sample/reduce impact of anomalous data/calculate a mean/ statistical analysis/increase reliability**;** [**R** accuracy]	1
6(c)	Species richness/number of different species**;** Population size/abundance/numbers of each species**;** Repeated/several samples/sampled at different times**;** $D = \dfrac{N(N-1)}{\Sigma n(n-1)}$/Simpsons Diversity Index**;**	MAX 3
6(d)	Named impact of introduced species: predators/competitors/pathogens/ parasites**;;;;** [**A** disease] One named <u>effect</u> for each eg disrupt food webs, dominate fragile ecosystem, other relevant effect**;;** [**R** 'damage' food chains] [**R** examples of competition/predation etc]	MAX 4
6(e)	<u>Antarctic Treaty</u>**;** commercial exploitation/mining is banned**;** hunting/fishing controlled**;** environmental impacts of human activities/research/tourism are monitored**;** tourists/human activity restricted to particular sites**;** research/conservation is encouraged**;** wastes/contaminants must be secure/unable to become dispersed/ leaks prevented**;** waste/litter is removed from Antarctica**;** import of waste/nuclear waste banned**;** alien species prevented from entering/eradicated/dogs no longer used**;** military activity is banned**;** inaccessibility**;** [**A** cause**;** impact**;** solution/control**;** of global climate change or ozone depletion]	MAX 3
Total		**15**