



**General Certificate of Education (A-level)
January 2013**

Environmental Studies

ENVS1

(Specification 2440)

Unit 1: The Living Environment

Final

Mark Scheme

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 events which all examiners participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the students' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for standardisation each examiner analyses a number of students' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, examiners encounter unusual answers which have not been raised they are required to refer these to the Principal Examiner.

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Set and published by the Assessment and Qualifications Alliance.

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

Question 1

	Answers	Mark												
1	<table border="1"> <thead> <tr> <th>Conservation Designation</th> <th>Description of Conservation Designation</th> </tr> </thead> <tbody> <tr> <td>Special Area of Conservation (SAC)</td> <td>Important and representative habitat, under <u>EU/Europe/European(Union)/Natura 2000 Habitats Directive</u> ;</td> </tr> <tr> <td>Ramsar site</td> <td>Area of wetland that is of international importance and protected for conservation and sustainable use ;</td> </tr> <tr> <td>Green Belt</td> <td>(Area around an urban area to) restrict urban expansion/sprawl/stops towns merging ;</td> </tr> <tr> <td>National Park</td> <td>Large, relatively wild area designated for informal public recreation, wildlife conservation and maintenance of the rural economy ;</td> </tr> <tr> <td>Special Protection Area (SPA)</td> <td>Area designated for conservation under the <u>EU/Europe/European(Union)/Natura 2000 Birds Directive</u> ;</td> </tr> </tbody> </table>	Conservation Designation	Description of Conservation Designation	Special Area of Conservation (SAC)	Important and representative habitat, under <u>EU/Europe/European(Union)/Natura 2000 Habitats Directive</u> ;	Ramsar site	Area of wetland that is of international importance and protected for conservation and sustainable use ;	Green Belt	(Area around an urban area to) restrict urban expansion/sprawl/stops towns merging ;	National Park	Large, relatively wild area designated for informal public recreation, wildlife conservation and maintenance of the rural economy ;	Special Protection Area (SPA)	Area designated for conservation under the <u>EU/Europe/European(Union)/Natura 2000 Birds Directive</u> ;	5
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Total	5													

Question 2

	Answers	Mark
2(a)	Named impact/biological/physical/social impact; [A habitat destruction] site is surveyed/sampled; reference to the Leopold matrix; magnitude/severity/quantitative assessment of impacts; modifications/improvements to reduce impacts proposed; alternatives suggested; compare with outcome if development does not proceed; report produced/summary document;	MAX 4
2(b)	Impact on surrounding area limited to single area; named impacts;; eg noise, dust, visual, traffic/congestion, habitat loss/destruction in <u>surrounding</u> area shorter perimeter/less edge effect; reduced need for infrastructure; eg roads, buildings, power cables mitigation/amelioration is more economic/easier; reclamation is more economic/easier;	MAX 3
2(c)	Respiration/decomposition; photosynthesis; formation of carbonate shells/coral; [A correct reference to sinking of faeces of marine organisms] [R incorrect references to photosynthesis and respiration]	MAX 2
2(d)	Oxygen/ozone; [R anthropogenic gases]	1
Total		10

Question 3

	Answers	Mark
3(a)	Easier to raise money/creates (eco)tourism; increases awareness/publicity/education/support for conservation; habitat of flagship species protected; other species (in the habitat) are protected; [R protection of Fragrant Orchid alone]	MAX 2
3(b)(i)	Representative/more reliable/increased validity; [R precise]	1
3(b)(ii)	(Grid with) co-ordinates/numbers/GPS co-ordinates; method of producing random numbers; eg tables, computer program, random number generator [R throwing]	2
3(b)(iii)	Mean number per quadrat/total number (from 20 quadrats); [R mean of % cover] area of quadrat/specified area; eg 0.25m ² ; multiply up to total area; [R if incorrect maths included] award maximum of 1 mark if incorrect method used eg % cover, Lincoln index	MAX 2
3(c)	Information boards/notices/leaflets/education; footpath/trails; fencing/cages/exclusion/space zones; time zoning; honeypot site/feature away from orchids; wardens/legal penalties;	MAX 3
Total		10

Question 4

	Answers	Mark
4(a)(i)	Pollen/nectar produced at different times; varied diet/wider choice of food/more niches/less competition; insects adapted for specific plants;	MAX 1
4(a)(ii)	Shelter from predators/adverse weather; increase range of niches; biological corridors; provision of named resource;; eg breeding/nest sites, hibernation sites, nesting material, other food (eg nectar), water [A less use of/fewer pesticides]	MAX 2
4(b)	Habitat loss/change to named alternative use/fragmentation of habitat; pesticides/named pollutant; loss of/competition for named resource; introduction of alien species; predation; disease; climate change/adverse weather; deliberate killing/exploitation;	MAX 5
4(c)	Provide resources;; eg silk, cochineal, honey, bait, insects as food, wax, source of genes provide a service;; eg aesthetic/interesting, pest control, nutrient cycling, medicinal, support human food species, indicator species, biomimetics	MAX 2
Total		10

Question 5

	Answers	Mark
5(a)(i)	Community maintained by human activity; process of succession/climax community stopped/deflected/disrupted; named method of maintenance; eg burning, mowing, introduced grazing animals, ploughing [R coppicing as in stem]	MAX 2
5(a)(ii)	Secondary succession/succession restarts; colonisation (by new species); pre-existing species out competed; biodiversity changes; biomass increases;	MAX 2
5(b)(i)	Species have different niches/habitats/requirements/ranges of tolerance; habitat changes as succession proceeds/different stages/ages/heights of coppice cycle; named resource/conditions available at different times;; eg food, nest site, shelter, roosting sites, space for flying, light intensity, wind speed competitive exclusion/out competed by other species; [R migration]	MAX 3
5(b)(ii)	Change in named abiotic factor;; eg light, humidity, wind velocity specified change in vegetation structure; eg less ground vegetation, less shrub layer, more leaf litter, taller trees, more branches reduction in named habitat requirement;; eg food sources, nest sites, roosting sites change in vegetation diversity; increased predation; increased competition;	MAX 3
Total		10

Question 6

	Answers	Mark
6(a)(i)	<p>Hard to see/catch/well camouflaged/hidden/dense vegetation/quick moving; hard to identify species; hard to identify individuals/multiple sightings of same individual; hard to access areas/large area/undiscovered populations; migration/population change/births/deaths; short survey periods/too time consuming; indirect methods are unreliable; eg scats, droppings, tracks counting/catching causes disturbance; (sub)sample sufficient to estimate total;</p>	MAX 2
6(a)(ii)	<p>lack of genetic variation/<u>small</u> gene pool; inbreeding; [R <u>interbreeding</u>] increased vulnerability to genetic disorders/recessive gene problems/birth defects; [R more mutations] reduced mate choice/reduced group sizes/social opportunities; low fecundity/slow breeding rate causes slow population recovery; less able to defend territories/resources (against other species)/protect from predators; small numbers mean that the loss of one individual has a greater impact/ population has increased vulnerability to chance events; eg disease, forest fires, storms rarity increases value to poachers/hunters/collectors; increase conservation efforts/urgency; less intraspecific competition increases recovery rate;</p>	MAX 3
6(b)	<p>Tourism/brings money in to local economy/people pay to see them; rarity attracts conservation funding/flagship species; biomimetics/qualified non-medical research; eg GM [R unqualified scientific research] value to poachers/hunters/collectors; gibbons benefit other economically valuable species; eg spread seeds or pollen intact forest/gibbon habitat has economic value; eg watershed protection, forest products</p>	MAX 2

Question 6 continued

	Answers	Mark								
6(c)	<p>Habitat loss/degradation; named human activity(that causes habitat loss/degradation);; eg settlements/urbanisation/buildings/construction, clearance for subsistence agriculture, commercial agriculture, mining, infrastructure/road building, dams/reservoirs, timber trade, fuel wood, named pollutant eg acid rain [A unqualified agriculture for 1 mark]</p> <p>named pollutant that kills species; eg mercury, pesticides</p> <p>fragmentation/islandisation/lack of biological corridors; example of species interdependence/named example of <u>increased</u> competition/increased predation/loss of named resources;; eg food, nest sites</p> <p>hunting/poaching/collecting/exploitation; inbreeding/lack of genetic diversity/increased probability of genetic disorders/reduced choice of mates; disease; introduced species; climate change/<u>increased</u> forest fires; <i>Quality of Written Communication</i></p> <table border="1"> <thead> <tr> <th>Mark</th> <th>Descriptor</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>All material is logically presented in clear, scientific English and continuous prose. Spelling, punctuation and grammar are almost always correct. Technical terminology has been used effectively and accurately throughout. At least half a page of material is presented.</td> </tr> <tr> <td>1</td> <td>Account is logical and generally presented in clear, scientific English and continuous prose. Minor errors occur in spelling, punctuation and grammar. Technical terminology has been used effectively, and is usually accurate. At least half a page of material is presented.</td> </tr> <tr> <td>0</td> <td>The account is generally poorly constructed and often fails to use an appropriate scientific style to express ideas. Spelling, punctuation and grammar contain many errors.</td> </tr> </tbody> </table>	Mark	Descriptor	2	All material is logically presented in clear, scientific English and continuous prose. Spelling, punctuation and grammar are almost always correct. 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 and continuous prose. Minor errors occur in spelling, punctuation and grammar. Technical terminology has been used effectively, and is usually accurate. 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. Spelling, punctuation and grammar contain many errors.	<p>MAX 6</p> <p>2</p>
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Total		15								

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