A-LEVEL
Environmental Studies

ENVS1: The Living Environment
Mark scheme

2440
June 2015

Version: 1.0 Final

Mark schemes are prepared by the Lead Assessment Writer 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 associates 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 associate understands and applies it in the same correct way. As preparation for standardisation each associate 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, associates encounter unusual answers which have not been raised they are required to refer these to the Lead Assessment Writer.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of students' 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.

Further copies of this Mark Scheme are available from aqa.org.uk

Environmental Studies

June 2015 **ENVS1**

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

AO = Assessment Objective

<table>
<tr><th>Question</th><th colspan="2">Answers</th><th>Mark</th><th>AO / Spec. Ref.</th></tr>
<tr><td rowspan="9">1</td><td>Method / equipment</td><td>Purpose</td><td rowspan="9">5</td><td rowspan="9">AO1
3.1.5</td></tr>
<tr><td>Beating tray /other methods of disturbance AND collection;</td><td>Collecting invertebrates from vegetation overhead</td></tr>
<tr><td>Tüllgren funnel</td><td>Collecting organisms/invertebrates/named taxon from soil/leaf litter;
[A soil organisms]
[R ground]</td></tr>
<tr><td>Lincoln Index</td><td>Estimation of population (size);
[A population density]</td></tr>
<tr><td>Kick sampling</td><td>Collecting river bed invertebrates</td></tr>
<tr><td>Transect;</td><td>A line or belt used to locate sampling sites along an environmental gradient</td></tr>
<tr><td>Quadrat;</td><td>A defined sampling area, usually square</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>Total</td><td colspan="2"></td><td>5</td><td></td></tr>
</table>

Question	Answers	Mark	AO / Spec. Ref.
2(a)	trees cut to ground level/leave a stump**;** different area cut each year/in rotation**;** regular cycle/3 – 30 years**;**	max 2	AO1 3.1.2
2(b)	18 x 17 or 306 **and** (2x1)+ (8x7)+(3x2)+(5x4) or 84**;** (306/84) = 3.64**;** [Award 2 marks for 3.64 with no working] [Allow 1 mark where correct calculation made based on figures with a single error] [**R** 3.6]	2	AO3 3.1.5
2(c)	light traps**;** standardised features of traps**;;** eg same size of traps intensity of bulbs type of bulb systematic sampling/similar positioning of sites**;** same number of traps in both areas**;** standardised feature of time**;;** eg traps left for same length of time same time of year/season same weather conditions/dry/still night same time/simultaneous moth species identified/number of different species counted**;** count number of individuals of each species**;** repeat for mean/statistical analysis/validity/reliability/reduce the impact of anomalies**;** repeat at different times of year (to account for behaviour changes)**;** (maximum of 3 marks for standardised techniques if incorrect method chosen)	max 6	AO3 3.1.5
Total		**10**	

Question	Answers	Mark	AO / Spec. Ref.
3(a)(i)	new food species**;** source of new genes/new characteristics/GM/hybridisation (to improve existing food species)**;** pest control**;** named interspecies relationship**;**	max 2	AO2 3.1.2
3(a)(ii)	maintains humidity/(evapo)transpiration/evaporation**;** maintain rainfall**;** reduce wind speed**;** maintain temperature/acts as heat store**;**	max 2	AO2 3.1.2
3(a)(iii)	reduces CO_2 concentration/(increases) sequestration of carbon/carbon sink**;** maintains (atmospheric) temperature/reduces (enhanced) greenhouse effect/reduces greenhouse gases**;**	2	AO2 3.1.2
3(a)(iv)	interception (reduces raindrop impact)/roots bind soil/OM binds soil**;** reduced soil erosion**;** into rivers/transported to coast**;** mangroves(within rainforest) trap sediment**;**	max 2	AO2 3.1.2
3(b)	high light levels**;** high temperatures**;** high water availability**;** stable conditions/low seasonal variation**;** long time for evolution/no great changes in recent geological past**;**	max 2	AO2 3.1.2
Total		**10**	

Question	Answers	Mark	AO / Spec. Ref.
4(a)	**ecosystem** interaction between organisms **and** with their (physical) environment**;** **biome** (large) area with a distinct climate **and** characteristic community/distinctive flora and fauna**;**	2	AO1 3.1.3
4(b)(i)	new food**;** may eat/deterpredators**;** may eat competitors**;** may be pollinators**;** may be seed dispersers**;** creation of named favourable condition**;** eg shelter from weather, predators nest sites [**R** habitat]	max 2	AO1 3.1.2/3.1.3
4(b)(ii)	predation**;** competition for named resource**/**niche overlap**;** disease**/**disease vector**;** creation of named unfavourable condition**;** eg release of toxins dam creation by beavers	max 2	AO1 3.1.2/3.1.3
4(c)	abundance/population of plant species**;** species diversity/richness**;** damage to plants**;** plant height**;** leaf/vegetation cover/area**;** comparison between sites**;** monitor over time**;** population of introduced insect species**;** correlation of insect numbers with damage on individual affected plants**;**	max 4	AO2 3.1.5
Total		**10**	

Question	Answers	Mark	AO / Spec. Ref.
5(a)	**SPA : Ramsar comparison** EU **:** International**;** Birds **:** Wetlands**;** Natural England (etc) **:** DEFRA**;**	max 2	AO2 3.1.2
5(b)	AONB**;**	1	AO1 3.1.2

<table>
<tr><th>Question</th><th>Answers</th><th>Mark</th><th>AO / Spec. Ref.</th></tr>
<tr><td>5(c)</td><td>appropriate named landscape feature;;;
description of benefits to wildlife linked to feature;;;

landscape features
eg
hedge
ditch
trees
dry stone wall
pond
buildings
named landscape designation

benefit to wildlife (credit each benefit only once)
eg
(biological) corridor
food source
shelter from predator
breeding site
other named niche/habitat feature
control of named abiotic condition

Quality of Written Communication
<table>
<tr><th>Mark</th><th>Descriptor</th></tr>
<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>
</table>
</td><td>6

2</td><td>AO2
3.1.4</td></tr>
</table>

Question	Answers	Mark	AO / Spec. Ref.	ID
5d(i)	all aspects given a financial value**;** comparison of positive **and** negative costs/proposal goes ahead if benefits exceed costs**;**	2	AO1 3.1.4	**E**
5d(ii)	part of EIA**;** impacts quantified**;** importance **and** magnitude of impacts**;** pairs of scores multiplied/multiplied scores compared**;**	max 2	AO1 3.1.4	**E**
Total		**15**		

Question	Answers	Mark	AO / Spec. Ref.
6(a)	reduce seed dispersal**;** less food for predators/parasites dependent on elephants**;** less trampling/grazing leads to increased plant growth**;** more food for herbivores/less competition for food**;** less faeces for detritivores**;** less dead wood for invertebrates/detritivores**;** fewer water holes made, less water for other species**;** reduced clearings changes named abiotic factor for plant growth**;** reduced grazing creates competition between plant species**;** less faeces for soil nutrients reduces plant growth**;** reduced conservation effort/funding/ protection for other species**;** lack of pathways for other species to use**;**	max 3	AO1 3.1.3
6(b)	90 000 – 52 000**;** 38 000 (fewer)**;** [Award 2 marks for correct answer with no working] [Award 1 mark for 90-52=38 **or** 38]	2	AO3 3.1.3
6(c)	ban/control of international trade in elephants/elephant products**;**	1	AO1 3.1.2
6(d)	African forest elephants: (later sexual maturity leads to) later start of breeding**;** (longer pregnancy/less frequent births leads to) slower breeding**;** (smaller captive population leads to) small gene pool/inbreeding**;** larger so need more space/food/more expensive to keep adequate population in captivity**;** [**R** interbreeding]	max 2	AO3 3.1.2

Question	Answers	Mark	AO / Spec. Ref.
6(e)	named method**;** detail of how method increases success**;** eg cryopreservation deep freezing of eggs/sperm/embryos/plant tissues for future use **or** artificial insemination/AI transfer of semen into female **or** embryo transfer transfer into female of more common species **or** micro propagation many plants produced by tissue culture **or** control of habitat to induce breeding light level/day length/temperature	2	AO1 3.1.2
Total		**10**	